The Health Impact of Chemical Exposures During the Gulf War: A Research Planning Conference

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Workgroup 4 – Prevention

Day 1 – Sunday, February 28, 1999

Melissa McDiarmid, MD, MPH, Chair
Assistant Professor of Medicine
University of Maryland
Director, VA Depleted Uranium Program
Occupational Health Project
Baltimore, Maryland

Each of the folks up here at the table are supposed to have eight minutes which I actually have an electronic friend that's going to hold people to eight minutes. Just in terms of some information for my colleagues up here, you will get seven minutes and when you see the yellow light go on, that means get your act together because you only have a minute left if you want to summarize. If there's time left, we'll take questions from the audience, however, I just want to assure the folks in the audience that tomorrow is when there will definitely be planned time to receive input. Make sure you do sign up on those sheets that are outside down the hall if you want to have an opportunity to make a comment tomorrow. That's how we can maintain an opportunity to find out how much time we have, and give folks a chance to say their piece. Although we have full dossiers on everybody up here, can we first go around the table and say who we are, and maybe, who we're representing and then we'll start. Tim do you want to start?

Timothy Tinker, PhD
Chief, Communications and Research Branch
Division of Health Education and Promotion
Agency for Toxic Substances and Disease Registry
Atlanta, Georgia

My name is Tim Tinker. I am with the Agency for Toxic Substances and Disease Registry, and will be co-facilitating this session.

Douglas Rokke, PhD
Assistant Professor
Department of Physical and Earth Science
Jacksonville State University
Jacksonville, Alabama

My name is Doug Rokke and I am assistant professor at Jackson State University. During Desert Storm, I was a member of Bower's Raiders, that's the nuclear, biological, chemical weapons team), also headed up as a health physicist on the depleted uranium team.

LT COL Bob Thompson
Preventive Medicine Action Officer
Logistics Directorate, Medical Readiness Division
The Joint Staff, Pentagon
Washington, DC

My name is Bob Thompson. I am with the Joint Staff at the Pentagon, working J-4 Medical Readiness Division. I am the Preventive Medicine Staff Officer there. When I get some time, I will be talking about some of the concepts we put together to build upon lessons learned from the Gulf War.

Timothy Gerrity, PhD
Special Assistant Chief Research and Development Officer
Department of Veterans Affairs
Washington, DC

I am Tim Gerrity from the Office of Research and Development, Department of Veterans Affairs. I am filling in for Eula Bingham who could not make it today.

Henry Anderson, MD
Chief Medical Officer for Occupational and Environmental Health
Division of Public Health
Wisconsin Department of Health and Family Services
Madison, Wisconsin

I am Henry Anderson, Chief Medical Officer for Occupational and Environmental Health with the Wisconsin Department of Health and Family Services. I am an occupational medicine physician with a specialty in public health activities in surveillance.

Max Lum , EdD, MPA
Associate Director for Health Communication
National Institute of Occupational Safety and Health
Washington, DC

I am Max Lum. I am Director of the Office of Health Communication in the National Institute for Occupational Safety and Health, in the Office of the Director in Washington, DC.

Larry Edmonds, MSPH
Acting Chief, State Services Branch
Division of Birth Defects and Pediatric Genetics
National Center for Environmental Health
Centers for Disease Control and Prevention
Atlanta, Georgia

I am Larry Edmonds from the Centers for Disease Control and Prevention. I am in the Division of Birth Defects and Pediatric Genetics and have worked with the Naval Health Research Center in doing some studies looking at adverse reproductive outcomes.

LT COL Philip Bolton
Medical Advisor
Gulf Veterans Illness Unit
Ministry of Defence
London United Kingdom

My name is Philip Bolton. I'm an Army medical officer who is currently working in the Gulf Veterans Illnesses Unit in the Ministry of Defence in the United Kingdom. I am a general practitioner with interest in public health and a Gulf and Bosnia veteran.

Jack Heller, PhD
Senior Scientist
Deployment Environmental Surveillance Program
US Army Center for Health Promotion and Preventive Medicine
Aberdeen Proving Ground, Maryland

I am Jack Heller. I am a Senior Scientist in the Deployment Environmental Surveillance Program in the US Army Center for Health Promotion and Preventive Medicine. We look at environmental exposures to US forces troops deployed around the world. I've been working on Gulf War issues since 1990 and spent considerable time in the Gulf, particularly in 1991, looking at exposure to oil well fire smoke.

COL Ken Scott
Assistant Chief of Staff
Health Support Operational Training Units
Canadian Forces Medical Group - Headquarters
Ottawa, Ontario, Canada

My name is Ken Scott. I am with Canadian Forces Medical Group Headquarters. I am a last minute substitute for Dr. Tim Cook who was supposed to have been here. We wear many hats in our organization. He is also the personal physician to our Governor General and is traveling through Africa.

James Tuite, III, MA
Director, Interdisciplinary Science
Chronic Illness Research Foundation
Annandale, Virginia

My name is Jim Tuite. I am Director for Interdisciplinary Sciences, Chronic Illness Research Foundation and I directed a Congressional investigation into the health effect of Gulf War from 1993 to 1995.

CAPT Michael Kilpatrick
Director, Medical Outreach and Information
Office of the Special Assistant for Gulf War Illnesses
Department of Defense
Falls Church, Virginia

I am CAPT Michael Kilpatrick. I am the Senior Medical Advisor to Dr. Bernard Rostker, the Special Assistant, Deputy Secretary of Defense of Gulf War Illnesses.

Donna Dean, PhD
Senior Advisor to the Deputy Director
National Institutes of Health
Bethesda, Maryland

I am Donna Dean, Senior Advisor to the Deputy Director of the National Institutes of Health, a member of the Executive Planning Committee for this Conference, and most importantly to Melissa, facilitator with Tim for this workgroup planning meeting.

Dr. Melissa McDiarmid, Chair

I'm going to start, my prerogative as chair and also, maybe to take the heat off anybody else who

wasn't sure what they were going to say when they got here. What I did was, I started with real short bullet points that were given and are projected up here for topics in our workgroup. This is just an outline.

[The following frame work was used to guide the discussion].

Hierarchy of Controls

- Substitution
- Engineering
- Administrative
  - Health Education
  - Risk Communication
  - Surveillance
    - Environmental
    - Medical/Biomonitoring
- Work Practices
- Personal Protective Equipment

The first thing that I did, in deference to my risk communication colleagues that are here, is I separated health education and risk communication, because I knew that would make them crazy to see them on the same line and to make it clear that they are not the same thing, they are really two separate issues. But, the good news for us is that doubles our potential success in areas that we can work and focus on in our recommendations about prevention. As you can see, the other thing I did was move biomonitoring down to the bottom and I'm going to show you why I did that, in a minute. Being a public health preventative medicine person, I thought about what some principles might be that should guide us instead of just putting it in the order that I'd like to do it and then having to fight off all of my colleagues off up here with the order that they'd like to do it. I'd like to suggest that there might be some public health strategies that people who have had to be challenged with these types of ideas in the past, have brought some of their expertise to this. So, I just want to remind everybody that many of us who went to public health school, learned a prevention hierarchy, and that might be something we think about in terms of ordering our priorities, and that is that we learned that primary prevention is a better fix or intervention, if you will, than secondary prevention. Primary prevention, the best examples being vaccines which are true prevention of the untoward outcome.

Now, I knew as soon as I wrote vaccines that this was going to be a lightening rod issue, but it turns out that this is a generic example, and has nothing to do with the Gulf War experience, but more from an infectious disease notion of prevention. The definition of secondary prevention, which is early detection of unwanted outcomes, and an example here would be disease screening,

but as I tell my medical students and students in public health, secondary prevention is much less attractive to us, because the horse is already out of the barn. As preventive medicine experts, we've already failed if what we're doing is looking at early detection. So, obviously, the more we can do to make our recommendations on the primary versus the secondary side of prevention, the better.

Secondly, another notion, public health priority setting, these are some other thoughts that other colleagues in public health bring to bear when we sit around and circle the wagons and think about how we're going to set priorities. For example, in a previous life in OSHA, we talked about what were the issues that we needed to hit first, these are some of the things we think about: What is the severity of the hazard, what are the numbers of folks that are potentially exposed, the availability of interventions, are there fixes that do exist, and what are the chances for success? Those are some issues that we are supposed to think about when we formulate our list.

As an occ doc [occupational physician], I can't not remind us of the hierarchy of control technologies and that this again would be something that generically can be applied as a mask, if you will, over ordering the priorities that we might recommend. That is, that there's not just a list or a potential list of interventions, but that there is a list where the order matters, the order in which we choose from this list, matters, starting at the top, and we heard a little bit about this this morning. In fact, I think Dr. Spencer mentioned this issue of substitution. I don't think it takes a rocket scientist to think If we can eliminate the hazard all together by using something else, that's a pretty elegant way to start. I think he mentioned that he was surprised that pyridostigmine would be paired with a bromide, rather than perhaps another potential constituent that may be less toxic. So, then if substitution can't eliminate the hazard, we move down in the order that you see here and go to engineering controls. In other words, is there a way that exists that we can engineer out the hazard, that we can put an actual, physical engineering barrier between the exposed person and the hazard? If you can't control the hazard that way, then you continue to move down. And I think that there are a lot of opportunities here in administrative controls for what our task is in the next couple of days. I consider medical surveillance an administrative control although that's controversial, but that's where I'd put it.

Environmental surveillance is perhaps another administrative control. A lot of administrative controls suggest that a group has thought about a problem and written something down about what they want to do about it. There is some knowledge and some thought given to it and it is written down about how they want to proceed. Record keeping, which we've heard about already, and surveillance. Surveillance can include both disease surveillance, exposure surveillance and the idea of registries that we already heard about today. Work practices are sometimes lumped with administrative controls and I'm just breaking them out here because again, it gives me more hope that there are a number of things that we could make recommendations about. Work practices are ways we talk about handling or conducting

ourselves, even in the military, for example, in a military occupation around a potentially hazardous substance. It's an agreed upon way in which we decide how to do our jobs when we cannot totally eliminate the hazard and must have something potentially hazardous in our job. There's a way to approach doing that and that is what is communicated in work practices.

Finally, at the bottom is personal protective equipment. That acknowledges that we can't fully protect people, and we have to put them in harm's way, and we put the worker, the exposed person, in harm's way, but with personal protection. It's the least desirable prevention, because it means that we are putting somebody in a hazardous, uncontrolled environment and we have to depend on people to do something right, at a minimum, they have to wear their personal protection equipment correctly. So as you can see, that's from a public health point of view, the least desirous.

So, then I tried to put these ideas together and anything in bold was originally what was given to us as the task, by those who put this together. This was actually in the right shape at one point, but at least if you can follow what's bold here, that's what people suggested as things we might be able to do. I've just embellished them a little bit and put them in the order of a hierarchy of controls. Prevention types are on the left, which would be primary or secondary prevention. A lot of the things that we're going to be able to do could have a primary or secondary tag, depending on the detail we bring to it. We might also, ultimately, as a part of our progress in the next couple of days, put tags next to them in terms of the number of folks who were potentially exposed, the severity of the hazard, are there interventions that are available and what is the potential of success. So those are my initial thoughts about how to proceed. Tim, would you like to go next?

Dr. Timothy Gerrity

I'm in my second career after being at the University of Illinois for a number of years, I found that the risk assessment, risk management paradigm that the National Research Council of the National Academy of Science put together in 1988 was a useful way of looking at a number of issues that related to environmental health. That is, basically looking at the chain of events, first of all, the curves from the generation of the source. You could substitute anything from an environmental toxin to an infectious agent, you could really put just about anything in that box there. From the source, you develop some kind of exposure concentration. There is also transport. If, as it was pointed out by one speaker this morning, you only have an exposure if there is an individual who intersects this concentration and then you could have exposure, then what you need is the intake of that exposure to create an internal dose, then that dose generates a response. So, you can use this to look at a number of things. What are going to be the determinants of response, and there are several that you can look at. You can add some more if you really think about it besides what the intensity of the source is, its duration, transport and fate, leading to a concentration; the time/activity/behavior, for example, of the individual is going

to be a major determinant of response. Further down the line here between dose and actually the lower dose response, there's going to be factors of susceptibility to that agent and to a given dose of that agent. Going across, you've got mitigation strategies.

Today, we're talking about prevention, intervention and treatment, and you can look and see, this isn't complete, because if one talks about secondary prevention, you've got secondary prevention, which is here, after the exposure and dose. But I was really interested in primary prevention, where you do something about stopping the source itself. You do something here between the intersection of the individual and the concentration. It could be use of protective equipment, it can be altering time/activity/behavior, that time/activity/behavior could have been the result of having to go to the protective concentration. It can go on and on and you can elaborate on this visual way of looking at how one could approach prevention as well as other mitigation strategies just by using this paradigm. It's there for your consumption. Again, that also helps target where you publish your research. It's really sort of a visual representation of what you have put forward, very nicely.

Dr. Douglas Rokke

I think one of the things that we saw in Saudi Arabia and we've seen since, is the fact that this was a multiple chemical exposure. One of the problems we ran into, and it still seems to not do well for the preventive medicine community, is the lack of knowledge that we saw when we followed in and around specialized experts. It was so complex. We had water borne, we had air borne, we had soil borne, we had toxic industrial chemicals, we had radiologic from the depleted uranium, we had radiologic from all of the instruments. The knowledge base that we had, other than specialized teams, specialized experts in theater, was very lacking. So the education comes in as critical. If we are going to get people up to speed, they have to have knowledge and be able to recognize what the hazards are, and then determine what type of strategies, or intervention strategies can be done to provide mitigation. The next part, if we have knowledge and recognition, how do we detect what we have, and if we detect it, can we recognize what is occurring. Too many cases in Saudi Arabia, and unfortunately, I was there and put a lot of people on missions that now they're dead over, or sick over, is recognition, then take an action. I want to read something real brief, and this happened for real and this is not new. This is an Army news story that came out. "The last of 32 soldiers of the 20th Chemical Detachment, 84th Chemical Battalion, returned home June 30th after a four and one half month deployment to Kuwait. After two years of training, the biological integrated detection system, the only active duty BID units in the country finally got the opportunity to put all their skills to work in a real life situation." Now I am going to read this as a quote "We performed bio-surveillance missions, said the 1st Sergeant, 20th Chemical Detachment. Our job was to detect if any biological agents were used and to contact the command so they could protect the force." This is where the knowledge and the recognition comes in to be a slam dunk. "We had readings because of dead animals all around, said the 1st Sergeant. There were never any biological agents detected in the air." How can a

BIDs unit detect equipment when you've got dead animals all around, and the individual not have the knowledge to recognize a problem and say, time out, we've got to stop? This is from last year. These gentlemen are sick. So, it's recognition from knowledge.

Procedures. What kind of procedures can we use once we recognize it, in order to mitigate it? That's absolutely critical. We never got there. Some procedures that we had didn't work, other procedures that we had we had to figure out as we went along, did work, and we need to look at that.

Protection. Personal protection. I can't reiterate that. In a war environment, you don't have the capability to use the PPE that we would use under OSHA guidelines and we've all been there, and we've used it and we've taught it. I can't do that in war. I can't do that in these situations. What PPE will work, and as a consequence, how will I protect these individuals and what exposures will happen if that PPE is inadequate? That comes back to the exposure criteria. If I'm going to do prevention, I have to determine what type of exposure criteria I have. How much can I be exposed to without seeing health and physiological consequences of? We had, in theater, acute, repeat, acute, physiological reactions to the oil well fires, smoke and everything. It's a standing joke among us who were there in it, and I was with a preventive medicine team, and I met the guys as they first came out of Kuwait, doing the initial analysis on oil well fires. We had a joke, we kept popsicle sticks handy so we could scrape the soot, the stuff, out of our nostrils, out of our throats and out of our ears. How do you protect, and what is the exposure criteria? Same thin with the radiological. What is the exposure criteria? We've got to figure this out and if I can't deal with it, then I have to figure out, what do I do?

Another thing, is mitigation procedures and criteria. How do I prevent this in the future? How do I deal with the mitigation effort? One of the things that bothered me the most when we were looking at all this stuff and making recommendations for mitigation was, memos that came to us in theater. One memo stated specifically, and is now known as the famous Los Alamos memo, which told us to make everything politically correct and to remember, we don't want to disrupt the system. As a preventive medicine expert, if I find something that's wrong, I have to tell you and then I have to do something. The other thing came out of the Defense Nuclear Agency, and identified all of the hazards that we were going to see, early on was some of the contamination and exposures. Again, it was disregarded. If we see a hazard, or somebody raises it up and it doesn't matter who you are, or where you come from, it could be that E1 there, or the general, or a civilian; if they raise the hazard issue, we've got to figure out what do I do when I have to have mitigation.

This whole thing is very interesting. Prevention is the key to the game. However, without education to where I have recognition, without the ability to determine what I do with procedures in the event that I have recognition, and select proper procedures, without the ability to protect myself and also, without the ability to do something in the end if something goes sour, we've got

a problem. That's what happened. It's not just going to happen in Saudi Arabia, the WMD stuff, Weapons of Mass Destruction, we are looking at today. When we wrote that original program, we had to look to the future, not to the past. We've got a choice and we've got a big thing. The research agenda here is awesome. How do we educate, how do we mitigate, how do we prevent, and more important, how do I get that ability to recognize and select an appropriate course of action out to everybody, whether they be military or civilian, because the only difference between what happened in Saudi Arabia and what happens in the civilian world is intent. One is a deliberate release and one's an accidental release.

LT COL Bob Thompson

On the Joint Staff, we have looked at the Gulf War and tried to extract from that, lessons learned in order to put together a concept. I want to spend a couple of minutes talking about that concept, and then, from that concept, pull together some experts to develop an integrated priorities list for R&D that supports that concept. The concept is called force health protection, and it basically brings a life cycle management approach to dealing with service members from the moment they are recruited and assessed on active duty until they separate from service and are turned over to the VA. We want to do a better job in assessing their health as they come on active duty, health outcomes they experience while they are on active duty or active service, and then, when they are separated. So it's an attempt to bring a balance, not just with curative medicine, where we have always been strong, but also more emphasis on preventive public health type initiatives. As a result, there are three pillars. One is trying to keep the force healthy and fit to begin with, even before they get into an operation or deployment. Two is, once they deploy, casualty prevention. We have, in the past, taken steps to identify threats, take proper counter measures, surveillance and interventions as they are needed. With our program, we are trying to take a more systems approach to that across service lines, because our operations now are joined. There are very few operations where you see just one service deploying on. The last thing is that one of the reasons that we've gone to this, is because it is paramount now, the health of the individual soldier. Weapons platforms are being operated by fewer and fewer people, smaller crews. Every individual takes on added value and importance to the operation of the mission, and so there is a need to make sure that we look at that individual closer throughout his or her service with his or her defense force.

As a result of that, we have recently put out guidance on surveillance that requires the services to assess one's health before they go on deployment, through a self-completed health assessment questionnaire. Based upon the results of that questionnaire, or the answers there, additional steps would be taken. During deployment, there is a comprehensive surveillance system in place now, to look at not only just disease and non-battle injuries, and battle injuries, but also for environmental occupational exposures. I won't talk too much about that, because we do have a representative from CHPPM on the panel who can talk more about the environmental surveillance program we have going on and the demo project that's about to take place with CENTOM in

Southwest Asia. It also includes at the end, a post-deployment assessment so that, if indeed there was an exposure in the environment that took place, or a perceived one that took place, it gives every service member the opportunity to bring it to the attention of the health officials and to either have that verified for them, or to let them know it did occur, but you were not in the region where the exposure took place. I mentioned to you that we have an R&D program. We pulled together expert panels, pulled together the force health protection program, to include the R&D part of it, to support the program, now and in the future. So, there are a number of priorities that were identified and one of them has to do with the surveillance piece, to get more automation into that system, so that when we collect this information, if indeed we have an exposure that takes place that we weren't aware of, or that takes place after the fact and retrospectively we have to go back, as we heard this morning, the evidence isn't there, the exposure data isn't there anymore to do the linkages, we would be able to go back through this automated system and do so. What's important though, is to look at environmental or BW/CW incidents, look at the personnel field and see who might have been in that area for the exposure to have taken place, and then finally, to look at the health outcomes of the unit, the individuals in that area.

Another area that is of importance to us is the diagnostics, the test kits, so we can get information and confirmation early on, and then, finally, a computerized health record, that goes in with surveillance, so we can better track and follow through on individuals, as well as do some better epidemiologic work in the future. I know I still have time, but that's good, it allows for more discussion time later on.

Dr. Henry Anderson

I think we're going to see a repeating theme throughout this, so I'm not going to duplicate what's already been said. A couple of things, it seems to me, that we have on the civilian side, are natural disasters and acute other types of disasters, and I think we've had experiences with train derailments and other situations like that. We found, for the community, often resources are available during the acute event, but after the event is over, it is treated as a separate issue and event, and the follow up and the tracking resource is gone. I think a key thing that the military will need to do is to keep in mind that just after the acute event or the war, as it were, is over, it does, in fact, run over into the period afterwards for a continuing period of time. Obviously, for the field commanders, acute casualty prevention is key and less attention is paid at the immediate time exposures may be occurring on chronic concerns. Yet for the maintenance of a professional work force for carrying through skilled workers throughout the military, the critical factor will be long-term maintenance and avoidance of chronic problems. I think one of the research issues that I would look at is, are there, and I don't think we have anything at this point, perhaps maybe some of the questionnaires will do that, but we do need to have attention paid to can there be additional screening up front to potentially identify individuals who have maybe a special risk and need a special focus on training and education for those individuals under various conditions.

That ought to be part of the deployment readiness criteria that each of the units has to maintain. So we have a sense of who can do what, to the best of their ability.

Health Education, recognizing hazards, certainly they're well-trained in the hazards of being shot and other conditions and less attention is focused on, perhaps, preventing the more subtle chronic conditions and being prepared to recognize them and report them. I have had an opportunity to see some of the new developments, that have in fact, been implemented over in Bosnia already. Much is moving forward, but I do think we need to underscore the importance of having an adequate preventive medicine force in that they have sufficient seniority in order to do their job in the field. Transporting specimens or storage of specimens gets a lower priority during wartime activity. It has to be kept in mind up front, to plan in advance for that so that when what is a reasonable action is taken at the time, you have contingencies in place for that. So, I think we have to do a great deal of planning, I think there are the environmental assessments that are done in advance so you get some sense, but there really needs to be that flexibility to address issues, to mitigate as rapidly as possible. You can't always anticipate what will be coming up, but having an adequate support structure in place. Critical in the aftermath or on a continuing basis, is the need for medical surveillance and an effort for early detection and early recognition of disease or unusual syndromes that may appear so that they can be evaluated very rapidly and whatever can be done, be done early on, to help the individuals early on. Of course, primary prevention is our ultimate goal, but under the conditions of the battlefield, primary prevention isn't always going to be possible, so we have to do the best we can to be sure we have those follow-up capacities in place.

Dr. Max Lum

I just want to take a couple of minutes and talk about the mission that we are supposed to have, so that I'm clear on what we will accomplish when we leave here. My understanding is that we are to make recommendations to CDC in the area of prevention, specific recommendations. I hope we take this opportunity to do that, to make some specific recommendations, related to prevention issues. It's interesting isn't it, that at a conference with 200 or more attendees, we only have a dozen people that we could get out to talk about, maybe two dozen people, to talk about prevention. I guarantee you, if we walk down the hall, it kind of mirrors our system, doesn't it? Where's the money? It's in treatment; there are sick people, that's understandable; it's in illness, treatment and research. Sixty million dollars can get your attention real fast in terms of group interest, but the real effort, and I totally agree with what Melissa said, the real emphasis that we could do in this committee, is put prevention on the map. I mean, really. Not just say it's a great idea to do it, but to make some solid specific suggestions. CDC, I think, really has the ability to work with a lot of partners. They work in all of their institutes with a great deal of partners. They know how to get information out and how to get information back, which I understand is the second part of the risk communication paradigm; to hear it back.

I heard a lot of things this morning that I was really excited about. One of those is, we need a medical curriculum that we can talk to people about. It's very difficult to get in medical schools, nursing schools with a curriculum, but pieces of the curriculum, where would it fit in the current medical school and public health structure? How would we do that? We have facilities to do that at CDC. We have contacts with state and county public health officials all over the country. Is this issue on their screen? No, it's not. So there's other issues. What do we know about the information we put out on the Net? What do we know about all that stuff? There is a lot of information on the Net, but how do we know people are using it? What are they doing with that?

I heard a person this morning talking about how important it is to have a trusted source of information. Shoot straight. That to me is absolutely correct. How do we do that at CDC? What lessons have we had in the past? Well, to pick one, the AIDS issue has been around for a long time, and we had problems with trusting, I think it's still an issue that we deal with, the trusted source of information coming from CDC. Yet, the Centers for Disease Control and Prevention has been able to set up coalitions of people in working, in getting information out and getting information back. Coalition means something very different to CDC than it does to a lot of agencies. CDC regards a coalition as the individuals are really guiding and in many ways, are in charge of the effort, and the government steps back a bit. It doesn't drive the system so much and that's how the system worked with AIDS, and it has provided a much more trusted and a more conscientious kind of information giving and receiving, which is the other part of risk communication. I would hope we come out with some recommendations in that area. Probably the most obscure that was released that has benefits for this meeting, particularly, was an effort that I was involved in as a representative from the Department of Health and Human Services. I was asked to sit on the PRD5 effort. PRD5 was very important. It's the Presidential Review Directive #5 and it was an effort by the Executive Office of the President to deal with issues of future deployments. What can we improve in research, in surveillance, in data gathering and in risk communication? But it dealt with future deployments. And we pulled together a committee and met many times to discuss the issues. I was Chair of that, intimately involved in the risk communication piece of it. In that report which was released I think, on Veterans Day, there was a chapter on what we should do related to risk communication. We had FDA on the committee. Now why would you have the FDA? What's their role? Well, patient inserts, patient information, inserts that go into medicines. FDA has had a tremendous experience in how you write those. How do you get information to people? And they were very helpful, I think. EPA, because again, they had tremendous experience in the environmental field and input into that report.

So, what you have is a very good report, I can only comment on the risk communication section, that went into the issues that I heard being talked about today. How we reach local and state health officials, how we involve training in a realistic way, pre-deployment, during and post-deployment. And post deployment could be in service or as a veteran. It seems to me we need prevention strategies in all four of those spots. And I've heard that in listening to these meetings. So I think my goal, before I leave this meeting, is to get copies of the PRD5 report and at least

have them here for you to examine. Because in that report, there are 83 specific recommendations in risk communication, and if we just did five of them, particularly the ones that have to do with the Net or the website, I think we'd be very, very well served. Also, the linkage between what we are doing, what we are planning to do, and local and county health officials. They are totally out of the game on this, as are family docs. I don't need to tell this audience that. But there are ways to reach those people. Not to overburden them with information, but to give them some basic information and a place to go for further information. We've had that problem in the environmental health area, we've had people carrying information to doctors. It's not something new and it gives them a point of contact.

I think we should look out of the box a little bit on our recommendations, and I think we should push here. I'm a member of CDC, I know what happens when you push. But I think we have an opportunity; I'd like to see us come out with some very specific recommendations. My personal recommendation is that we examine the PRD5 report. I don't mean we have to do that before we leave, but certainly as a guiding document. There's some great things in it across the board, not just in risk communication.

Dr. Timothy Gerrity

Thanks for bringing that up Max. I was the chair of the research element of the PRD5. I would agree with Max that the PRD5 should serve as a contributing document to the output of this committee and I would point out that Marie Swanson basically laid out PRD5 document in her presentation.

Mr. Larry Edmonds

What I bring to this panel is kind of a specific interest and expertise in reproductive health. I'm not sure it's been talked about a lot here, but the issue that comes up with Gulf War veterans is that they worry about their children, and rightfully so. This isn't new with the Gulf, this was a big issue in Vietnam. And it's going to be another issue down the line too, so I want us to think about prevention and the terms surveillance, research and prevention. At CDC that is the kind of model that we work with; try to collect good data, do research with it and develop a prevention agenda. With birth defects, it's very difficult. The vast majority of birth defects have causes unknown, probably two-thirds. But it's an important public health problem and I think that's the other thing that's not picked up a lot. Three to four percent of all populations, whether they're all vets or people who live in New York State, or whatever, three to four percent are going to have children born with major birth defects. So it's a serious health problem that's going to occur. Twenty percent of infant mortality is due to birth defects and this is an important problem that's going to keep occurring and it's going to come up in future deployments and future episodes where veterans are involved, so we need to develop prospective ways to monitor people of reproductive age.

The other thing, while we are developing recommendations here, I hope these are not just recommendations for CDC, because that's where I'm from. I don't need a recommendation, I think I know what we need to be doing. I think we need to start looking at recommendations for DoD and the VA and the CDC and a lot of different agencies involved in healthcare of vets.

Another thing that I think is going to be important in the future of prevention when we're trying to look at causes of birth defects, we're going to have to look at other issues besides environmental exposures, we're going to have to look at the gene and environment interaction. We're learning more and more about specific genes that might be related to making people more susceptible to environmental exposures. Smoking is one example. So we're going to have to address that issue, and I think it comes to setting up good surveillance systems, collecting maybe some biologic samples. We had the opportunity to testify before the Presidential Commission on Gulf War Veterans, and I think that two recommendations that we made there, I would still stand by, maybe expand on one of them. One of them was to develop a standard reproductive and fertility history, collected on personnel upon entering military service, and periodically updated. I think that was what Bob Thompson was recommending, too. I think maybe added to that now, we should think about collecting biological samples and storing blood specimens from these military personnel also.

The other thing we recommended, which I think is the pilot study that's happening, we recommended that DoD develop a standard surveillance system, on-going surveillance system on reproductive health, birth defects in particular, using civilian and military hospitals because a lot of people deliver in civilian hospitals. We've been working with the Naval Health Research Center in San Diego on doing a pilot study of setting up a surveillance system and I think they've been getting pretty good support and they're developing a combination of active surveillance systems in the military hospitals, and a passive surveillance system in civilian or CHAMPUS facilities. So, I'd like us to consider supporting that and trying to expand that and really put that into place in the military because the question is going to come up again, that, were children affected by the exposure or some chemical, or some event? If we have good data, prospectively, we can try to answer that. Another thing that the military is doing, is, the things we do know how to prevent that we need to emphasize more. I think getting people good pre-natal care, we need to really emphasize all people of childbearing age are on folic acid prior to becoming pregnant, work on issues and medical things such as fetal alcohol syndrome, making sure we have good education programs, good people in them that understand those risks. So I think there's some things that we can do and hopefully move forward towards putting these things in place.

LT COL Philip Bolton

As I said earlier, I'm from the UK. I thought I'd open my part of this discussion on prevention with a brief description of what we're up to and where we're at in the UK because there are differences. By doing so, I'll very briefly review the Gulf. We sent 53,000 people out there. An

armored division that fought alongside several corps of air forces and naval forces that fought in the coalition. That mission was successfully prosecuted with minimal battle casualties and exceedingly low disease and low battle injury rate. And we patted ourselves on the back and went home and thought, the risk communication of the health threats had got across to the force, we'd done the appropriate primary prevention of the immunizations that we acquired to prevent disease, both disease occurring from our medical intelligence of what was there in the country and the responses in anticipation of BW attack. We thought we'd all done very well, and then Gulf illnesses started being reported. These are made up of everyday illnesses that everyone gets and we understand the diagnosis and pathogenesis of them, and the pathology, and then there's this group of difficult to diagnose conditions. We have no means of primary prevention of that because we still cannot describe who's getting it, exactly what they're getting, the pathology and any likely causes, and without that, there is a problem with primary prevention. So we have accepted the primary prevention at the current state of knowledge of this is going to be difficult. And we looked at secondary prevention, as mentioned, and this goes into health surveillance systems, like the force health protection initiatives here, we're going along that route.

We do have one enormous advantage in this, and that is the National Health Service. Ninety five percent of the British population is registered in a nationalized health system and everyone has a unique identifying National Health Service number. And that gives us, with due ethical clearances, the abilities to look back and follow populations through without having to resort to repeated questionnaires in a mobile population that's difficult to find. But, even with that advantage, we still are wrestling with the problem with, what do we survey? There are disease registries for the major life threatening diseases and there is a wealth of health service usage information of these major diseases. There is very little, if any, information about the incidence of these overlapping syndromes of which the Gulf illnesses appear to be a part. The symptoms are enormously common, so we have a problem there and we are actually inviting academic departments in university public health departments around the country to tender for the work to do the research that looks into the methods of health surveillance. Having met the contractors just last week, again, they're going away from questionnaires, they're going back to routine medical procedures, the recruit assessment medical, what sort of procedures you do routinely during service, what you do to ensure that your force is fit, I mean, these are the cries that you've heard already, and how you assess health, post-deployment.

The other area, of course, is record keeping. Again, that was off a little ago, we're the first to acknowledge it. I think the reasons are entirely clear, in that we went to war in the Gulf with a record system that was designed for conflict in Northern Europe with movement into high intensity conflict from a standing start. Where the casual sick calls of the unit medical officer in the barracks just wasn't going to happen. People who were admitted to the hospital were not likely to come back to duty early, but would have shuffled down a casualty evacuation system back to England with all their medical notes and have reverted to peacetime procedures, with the dealing with the notes, and as they got better, would have been sent back as reinforcements.

Again, we're looking at it, and we're going down the same route of looking towards electronic records. These will have to link in with whatever the Health Service produces as their initiative towards medical records, and again, ethical and data protection problems will have to be overcome, but I think, at least, we don't have the problem of DoD having to link with VA, who only have a portion of those who self-report. We at least can track everyone.

Again, exposure data needs to be collected. And we're looking at ways of assessing various forms of exposure data gathered. In all of this, I would add a word of warning. It is very tempting to sit here and say we must do everything to protect soldiers before they go, and you know, pre-deployment medicals and sending people out to the zone of operations, to do all this exposure data gathering. There is a penalty. The penalty is that the longer you spend in the emergency that occurs, as the Gulf did, getting people ready, you may be facing a worse military problem, and you must balance the risks of sending non-competent troops out gathering information who are putting themselves at risk and perversely, you may risk increasing casualty rates that need not otherwise happen.

Dr. Jack Heller

There are a number of points I want to make, so I'll try to not to start rambling as I jump around. I'm not a researcher. In my everyday life, what I do is look at exposures to deployed troops, so in addition to going back and looking at exposures in the Gulf, we look at what's happening to our forces around the world. Colonel Thompson said, there are things we do, a lot more we do now, than we did in the Gulf, and that said, everything is not perfect. The technology we need to do, is not perfect. As a user, I think what I can do to add to this group is talk about the kind of things we need and the kind of things we develop. There's going to be a difference in the level of surveillance, whether we're in a hostile environment where there's combat, or whether we're doing a humanitarian effort, and more we're doing humanitarian efforts. In that case, we can obviously get more data and do better exposure work than we can with bullets actually flying.

So, those are a couple of points you need to look at. When troops deploy, the bottom line is, they are going to be exposed–air, water, and soil. There's no way around it. Now, certain of those things are easier to mitigate. If you have a contaminated water supply, you can always give them bottled water. If you have contaminated air, generally, you have to breathe the air, so, it's a much more difficult media to control. First let me say something about expectations. I think right now, some of our leaders have some unreasonable expectations about what we're capable of doing. Just looking at exposure, what they would like and what I would love, is if every troop had a dosimeter that measured everything he was exposed to and track every place that he was, and our problem would be solved. We're working on things like that, but the bottom line is, it's not there. So, what we have to do now, is go with what we have, and right now, that's area sampling and personal sampling. Going with that, you have to know where the troops are, and we don't always know exactly where troops are, they move around quite a bit.

So, some of the things I really think the group needs to work on are better methods for environmental assessment. We can look right now and get real time measurements for high level exposures and that's what combat commanders are concerned about–what will bring my troop down now? Not that they're not concerned about longer-term effects, but where we have a problem is looking at low-level exposures, what we have to do is sample and send it back to the States to analyze it, so it takes longer to intervene in an exposure. So one of the things we need to work on is better methods to measure low-level exposures immediately so there's less of a gap between when we can get data and do an intervention.

The other thing is, with low-level exposure, you get data and you go, what does it mean? What do some of these low-levels mean when you get multiple chemicals interacting together? The state-of-art toxicology now, doesn't always know. Some are synergists, some are antagonists. So, one of the other things we have to work on, in addition to just getting the equipment out there, better exposure data and better troop movement data, we need to know what that means in the terms of some of the low-level exposures. One of the other things we're working on with CDC's National Center for Environmental Health is going out and doing biomonitoring in troops. We're doing some pilot projects where we'll do it for certain routine operations. One is the CENTCOM Project in South Asia. Another piece we're look at is if there's a suspected exposure, but no environmental data, we would work with CDC to go out and draw biological samples to measure if indeed, there was an exposure.

We're working on a lot of these things now, but these things need more emphasis and have to be pursued. Another group, in addition to PRD5, the National Academy of Sciences has a number of work groups right now that are looking at future deployments. They're looking at better ways to look at risk assessment, better ways to look at environmental exposures, protective equipment and decontamination, and I can't remember what the fourth group is looking at. I believe their being sponsored by the Office of the Special Assistant. So, I think we need to look at what the National Academy is doing, in addition to PRD5 to help guide what we're looking at.

COL Ken Scott

I'm a substitute for Tim Cook, who's much younger, brighter and enthusiastic than I am. I too am not a researcher. I'm grateful for Drue Barrett having invited Canadian participation at this meeting. I'm particularly thankful that I was asked to do the workshop on prevention because it's very important to Canadians for reasons I will describe to you in just one second. I'm here to listen and learn as opposed to try and tell. You heard about the Goss Gilroy study, it was presented briefly this morning. It's a Canadian study, the first time that we tried to actually survey every single Canadian who served in the Gulf. So that's a study which I don't think the British have done. I think they are in the process of trying to do a similar type of thing, but not the entire population. I'm a Gulf War veteran, I also served in the French Congo and I served in Rwanda as the Canadian Contingent Medical Commander for six months. The Goss Gilroy study

found that it did not matter, this was a mailout survey, it did not matter which unit you served with in the Gulf in terms of your symptom rate or types of illnesses, whether you were with the Naval Blockade, whether you were in Bahrain, whether you were in the middle of the city, or whether you were with the field hospital in Al Qaysumah. We had observed in our Canadian Gulf War Clinic that crews aboard the HMCS Protecteur, that entire ship, 273 individuals from able seaman to captain, rotated between Christmas and New Year's 1990. The patient rate through our Canadian Gulf War Clinic was the same.

The Goss Gilroy study found the same as well. It didn't matter whether you were in the first crew or the second crew. The first crew, presumably was not exposed to oil well smoke, they never took pyridostigmine, they were not exposed to novel vaccines, they didn't see any insects, they did not get DEET, they did not get permethrin, they did not receive multiple vaccinations because they were always in a high state of readiness to deploy for sea. In December of 1997, I brought various Canadian specialists, I'm still a practicing clinician, as opposed to a thinker, from across the country to expand the number of clinics that we had from the one to regional clinics across the country. The Canadian military is a democracy, based on our own observations from other deployments as well as concerns raised by Canadian civilian health care providers, we decided not to call these Gulf War, we decided to call these post-deployment clinics. As of last month, our Minister responsible for Veterans' Affairs, Canada, Fred Mifflin, and our Minister of Defense, Art Eggleton signed a memorandum of agreement, allowing us to see retired Canadian servicemen from any recent deployment. It has certainly been my experience, running a fatigue clinic in Ottawa for many years, we've seen Canadians from each of our high intensity deployments, presenting the same types of complaints. As a specialist in the military, I can expect to deploy every 18 months on a mission. We tried to learn things from the Gulf War, we tried to apply some of those lessons to our recent deployment to the Gulf in 1998, in particular, detailed patient education about the anthrax vaccine, assigning of the acknowledgment of the anthrax, and seeing the patients again in follow-up. What happened out of that was some sections reported 100% adverse reaction rate, health concerns went up and right now, in our military, medical service is our number one problem, and we're looking at trying to bring back all of the 1998 deployed Veterans to physically examine them. Our number two problem we're dealing with right now is the former Yugoslavia because of where I happen to be, which is Ottawa, one of our largest bases is Petawawa, just north of us, so I see a lot of patients from the former Yugoslavia, because we've been going there for so long, both Croatia and Bosnia, we certainly had more Canadians go through that mission than any other mission.

The Gulf War veterans, as a whole, have more symptoms than any other mission, that's like the British study, as well, but that's because we sent more people to Bosnia, we have more Bosnian, Croatian problems with Canadians than we do in the Gulf. The biggest concerns about Yugoslavia and veterans are PCBs and bauxites. We cannot track to who was exposed to these potential types of things because we don't have good record keeping for that, and it's a big concern. Our number three issue involving us right now is Somalia. The unit that served in

Somalia was a Canadian Airborne of Petawawa. I go over there regularly to run clinics. Percentage-wise, I've seen more Somalian veterans than any other deployment. That's again, because I happen to live so close to that particular base. Methlaquin in Somalia is a big issue; there is big concern because of the neuropsychological changes induced by that product and aberrant behavior of our airborne regiment. Our Auditor General has ordered an investigation into that and it's certainly a big problem.

What are we doing? In Canada, we go to multiple places, we bring people back from multiple deployments with problems all the time. Prevention is very important. We devised a video which we show to all our troops prior to going, trying to sensitize them to some of the things they might see. We are working on a video of care givers, medical people, we have more problems than anybody else. We have treatment and stress teams at the smallest level. We are trying to increase their education, we are trying to improve our record keeping and we certainly need to do some better tracking. Thank you.

Mr. James J. Tuite

I've been a chemical hygiene officer in the past and had to develop and implement a chemical hygiene plan, so I've got some familiarity with what we're talking about here. Developing the plan isn't the problem, executing the plan is the problem. I believe that our goal should be to initiate programs of development and occupational safety programs, suitable for military use that will be suitable in a peacetime environment, and perhaps another one that will be suitable in a wartime environment. Some exposures of concern are unavoidable. But in the Gulf War, it wasn't that the hazard information wasn't known, it was misdirected, withheld, underestimated or under communicated. It's not that the data wasn't gathered, it's that the records weren't maintained. So we've got problems that aren't so much involved in the development of a plan, but rather the execution of that plan. In pursuit of that goal, dynamic hazards communications programs need to be developed at all levels, training at all levels, and a force-wide upgrade of skills and assignment of direct accountability for the collection of baseline specimens and data, maintenance of records regarding the direct and indirect exposure of troops to a variety of potentially hazardous materials, including routine and special medicine practices. These are critical first steps.

Another critical initiative involves the development and deployment of equipment designed to monitor exposure and biomonitoring of troops to detect the presence of non-hazards and markers of the effects of both monitored and unmonitored exposures. Yet another involves the development of plans and procedures for the introduction of occupationally hazardous materials into the military environment and the monitoring of the introduction of hazardous materials introduced by the enemy. This again is something that we have to do in the workplace. If we are going to bring a hazardous material into a laboratory or into the workplace, we have to develop a plan to deal with it before we make the decision to introduce, not right before we go into war.

Again, my big experience has been that the DoD has an excellent chemical hygiene program. In fact, I was the chemical hygiene officer for a Federal forensic laboratory and we modeled our program after the Department of Defenses's chemical hygiene program. The problem is that they limited that program to people that continually handled chemically hazardous materials and it was not passed on to the force, which to a greater degree as we go along, is more and more often exposed to many of these same materials. Commanders need to focus on both mission accomplishment and force protection issues. Often, tradeoffs will have to occur, but they need to understand the costs and will be held accountable for their decisions. That doesn't mean that you're going to make a decision that might cause people to become sick, and you're going to go to jail for it, for example. What it does mean is, if you're making reckless decisions without taking into account the force protection issues, you need to be held accountable for that, because force protection is probably the principal element of mission accomplishment. It's often overlooked in a mission accomplishment area. A rigorously enforced program involving understanding and accountability for hazard communications detection and the monitoring will be the greatest step forward in upgrading the level of professional and technical expertise in these areas and in restricting the needless exposure of these troops to hazardous materials.

Research in this area could focus on a broad spectrum of technologies and biomarkers. This addresses secondary prevention. I don't think we can separate secondary prevention in the case of the Gulf War veterans. Preventing them from progressing to those kinds of illnesses that historically we know are associated with these kinds of exposures, synthetic chemical exposures leading to many of the neuroimmune motor and neuroimmune related cancers. What we need to know is how they moved from whatever happened during exposure to those chemicals to those diseases. Certainly there are processes that take place in the interim. Those processes and some of the damage that occurs, that leads to multiple myeloma cancer, leukemia, non-Hodgkin's lymphoma, those diseases that we've seen in previous cohorts of veterans that were exposed to synthetic chemicals, are the things that we can look at. We need to look at the preliminary mechanisms in our biomonitoring programs and our surveillance programs.

For example, if there's a chromosome damage marker associated with multiple myeloma, are the veterans today showing evidence of that? And, what is the initial evidence that the sequence of events has set into motion? Therefore, analysis to determine if the biological anomalies observed within this group will be the most direct route to observing the effects of, the causes of, and the treatment for the reported symptom complexes. This will also provide insight into what types of preventive biomonitoring should occur during conflict. Again, I can't overemphasize we can develop all the directives and all the policies that we want, but without enforcement and execution of those policies, which tends to fall by the wayside and become a secondary priority in combat, those policies are ineffective. The military should consider, and I would recommend, external enforcement, especially in a peacetime environment, OSHA enforcement, because we do know that this is not just a problem for Persian Gulf War veterans. We do know that there is a higher incidence of some of these illnesses in the regular military forces, for example, as a result of

exposure to solvents and all sorts of things that they are routinely exposed to in their stateside, peacetime duties. Anyway, I think these are some of the things that we should consider, and it's not just the development of a plan, but how's that plan going to be executed.

Again, we had very good data, very good plans, prior to this war, but they weren't executed, the records weren't maintained. Had I done that in a civilian lab, I'd be in prison right now. We need to understand that that kind of mentality needs to go forward. Generals need to assign accountability to whoever their designated representative is, for the maintenance and collection of the data. Some of the things that are being recommended, theater-wide collection of environmental hazards, monitoring for trace chemicals and things, is impractical. But what is not impractical, is looking for the kinds of exposures that are present, at least in the general sense, and educating the troops against the hazards of those exposures, and taking preventive measures to make sure we keep records and are able to go back and reconstruct what has happened to these troops. This did not happen in the Gulf. Thank you.

CAPT Michael Kilpatrick

My clinical training is in infectious disease, both clinical care and clinical research. So, I have approached prevention from that direction, because that's what I know. Prevention, as Dr. McDiarmid has already said, is the primary goal in the practice of medicine. I think physicians worth their salt would say, if I didn't need to be doing my job, nobody got sick, I'd be very happy. We've prevented all disease. The reality of this is, it's not going to happen. When we take a look at preventing a disease, we say what are the processes that have to go on before you can prevent it? First is a definition of the disease. Until we recognize what the disease is, we're really floundering in trying to prevent it. You could try and do prevention anywhere along the processes that I'll talk about here, but you're going to be more effective once you've been able to get a definition of the disease. And, that definition may change over time as we learn more, as science learns more. I think one of the examples that I can give is the early viral examthyms. People didn't know viruses existed, but they knew that children got rashes and there were six different rashes that doctors could discriminate from one another and they agreed on the diagnosis, so they were called first disease, second disease, third disease, fourth disease, fifth disease and sixth disease. We now know what the six diseases are and the six different viruses that cause these diseases. And there are a whole lot of vaccines that children get, and we don't see very much of anything, except fifth disease anymore, because these diseases have been obliterated by the vaccines.

Once you've been able to define the disease, then how do you diagnose it, is the next thing. And those diagnostic tools aren't always available. We heard some discussion today about the immunology and the advances in immunology that are directly tied to organ transplant. A lot of doctors say, why did we ever try to transplant a heart, the person's going to live three years and still die, but the medical science that went forward, it became three years, and then five years, then

it became ten years, and who knows where we're going to be going. But understanding that human immune system and how to turn it on or turn it off is so important and it has had great bearing on trying to treat diseases of cancer. Treating the disease, as I've traveled around the world, there are a lot of different treatments. I think our mainstream medicine believes that we've got the right answer, but I think some of the cures that I see, and some of the alternative practices of medicine and the growth of alternative medicine in our country, indicate that people can get well, perhaps despite mainstream medicine. So I think we need to look at where is the research headed in those directions, and that's why I'm glad to see there are four workshops here. You'd be consumed if you tried to look at all of these.

But, I think if we're going to look at prevention, we need to understand that all of these are on-going too. If you could determine what the etiology is of the disease, the pathophysiology in the body, what happens when the agent is introduced in the body and makes the individuals ill, then you have more points to try to interrupt and this is what Dr. Gerrity showed in his presentation, and when Dr. McDiarmid talked about in the beginning, is where do you interrupt in prevention? I think that the challenge is that we have to say, where do we have gaps in the knowledge? Where do we have ignorance of the knowledge that's out there and how do we bring those together to try to formulate a plan to go forward, to say, how do we advance prevention. Wearing the uniform I wear is my choice, and I think that people need to understand that too. Our military is no longer a professional military, it's a volunteer military and people stay, particularly in the medical field as I've said to my family, as long as I'm having fun and get to do what I'm trained to do, I feel like I'm making a difference. I think the average service of somebody in the medical field in the military, I don't have the statistics, but if it's more than six years, I'd be surprised. Having been to a recent military post, a hospital of 38 physicians, four of those physicians were on active duty during the Gulf War, two were there, the other 34 were all newly trained out of medical school, doing their first medical rotation at the hospital, seeing people. I think we need to understand as I've heard today, when the patient's expectation exceeds the physician's ability to provide, we have frustration. That may not be part of prevention, but I think in a way, it is. It's risk communication. If our medical treatment staff don't really subscribe to say it may be more than I know, and try to be dogmatic with patients, it doesn't matter if you're military or VA or civilian, you're going to have very angry, upset patients. They can't get the care they believe that they are entitled to. So, I believe prevention is the key. It has to be tightly wrapped and integrated with all the other areas of understanding etiology, case definition, understanding the treatment, but I think this is where the money needs to go. This is what is ultimately going to do us well.

Finally, the seniority in our military. There aren't tremendous incentives to stay. With the booming economy, it's much easier to leave as an E3 or E4 and double your salary. There weren't options like that before, and so the education you've talked about needs to happen, but it has to be a continual, perpetual education, because those we're training today are not going to be the ones deployed next time, and we're going to repeat the Gulf War with inexperienced people

under the real craziness that goes on in war. Trying to do the best they can, but not having time to sit down and think about it. So, I think this is a key part of this Conference, and I look forward to some very positive outcomes.

Dr. Melissa McDiarmid, Chair

We succeeded in using up almost all of the time. There's a little bit of time though. I would like to make one comment, I didn't hear conflict. So I continue to be excited about what's possible. I also think that some folks have laid out some potential frameworks that we can work around in the next three meetings, maybe we should try all of them, or have smaller working groups within the working group. Some folks had some very specific ideas, which I think is really key. I think one of the ways stuff at meetings like this gets boiled away or evaporates, is that things get so big or so global that it's hard to take something away. So to the extent that there were some very specific recommendations, I think that's good and I think we should put those forward. Probably, we should make one comment, too, especially for the folks in the audience, that we were told to mention that we didn't. That is, that this is the beginning of a long-term process of perhaps making recommendations that could take up to five years to filter into the system of what's being recommended to be looked at for funding, so I just want to put that out there. However, one of the things that we did talk about at the first meeting of the team leaders, is that there are probably short-term and long-term goals or outcomes that can come out of these four meetings that we have, so to the extent that some of us would like to see some things sooner than later, there might be some short-term, more easily implemented recommendations that might come.

So, I don't think that it means that we have to wait five years to see anything, but that these planning processes, especially requests for proposals and funding, have very long pipelines. Does anyone have a burning desire to make a comment, or can it wait until tomorrow? That's when we promise that everybody on this list will be heard.

Dr. Max Lum

Can I introduce some contention? I've worked in Washington for too long. It's just part of my whole makeup. One of the things that I heard here, it's really not contention, it's more like treating the issue. It's a bad model, it's the medical model that says, if you don't know what the disease is, how are you going to set up any primary prevention? I mean, this is what we know. But we also know from the environmental risk communication that has gone on, both at ATSDR and NCEH itself, there's a lot you can do in what I call the educational area, in the primary prevention mode, even if you don't know the actual illness itself. You don't have to necessarily wait for a complete definition. Of course, if we have it, then it allows us to do a great deal more. But there is a reason, and perhaps we can talk about this a little more tomorrow, but we have a lot of outrage in terms of the way people look at what the government has been able to do and what we have tried to do, and why do they have that? Is there anything that we can do, at the pre-

deployment or at the training stage, that would have any effect on having that outrage in post-deployment? I think that's an issue, and I think the second contention issue is the planning of the post-deployment wasn't probably as good, I agree with you 100% in execution, but in post-deployment planning, I think we were really feeling our way. But I think that's an area where maybe that's the least of our concerns. I think it is on the agenda and it was clear in the PRD5, there were good recommendations in that area. I don't want to leave it on a negative note, but that's something we may do.

Audience Member

I wonder how many people in this room saw the ATSDR interagency draft document on multiple chemical sensitivities. I'd like to know what happened to the public input.

Dr. Melissa McDiarmid, Chair

I don't know of anyone here who can speak for ATSDR or that document. Perhaps there is somebody at the meeting.

Dr. Max Lum

Jim Cone.

Dr. Melissa McDiarmid, Chair

I think there's a number of folks, we can find out in the lobby, who would know about that. Let's have one more comment.

Beatriz Orduna-Salisbury, MD, MPH, FACPM
Occupational Environmental and Administrative Medicine
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I just want to say when we talk about levels of prevention, the ultimate level of prevention is peace worldwide and to not have war, and that's really the main thrust, even in the current definition of what public health is all about, if we can go with that definition, but peace is very important if we are really and truly to address public health. The other thing is, what about action research, especially in developing countries. My take at the time, and I was practicing public health, was what you can do in your everyday job, whether at DoD or VA, or out there in the world, you can learn, and at the same time when you are on the defense line when you are providing the service, you can apply. Some things can be done that are practical and simple and not big time research. I think it has a place here in prevention. One example in what was said by

the gentleman from the DoD in terms of what he mentioned about lifecycles and surveillance, one example is how about making it a policy and directive, that the soldier is not able to waive his exit physical examination. I see this very frequently when they are doing compensation and pension examinations. In the very beginning when the soldier enters, they should have the baseline examination, they should have continuing information, post-deployment and maybe also when they exit, so we have no gap in this in terms of the continuum of the information and knowledge of the health of this veteran. Maybe we should have a very universal, comprehensive exam that is universally used, so that there is a very good record.

Dr. Melissa McDiarmid. Chair

Thank you for your comments. I think we're going to have to end it now, because there are a number of folks who need to eat and be back for the evening session. So please sign up if you'd like to comment tomorrow. The length of time depends on how many people would like to speak. Everyone will get an opportunity.

The session was adjourned.

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Day 2 – Monday, March 1, 1999 - Morning Session

Dr. Melissa McDiarmid, Chair

Why don't we get started? We're running a little bit late and I want to give everybody a chance to say something. This is a public input session and has been planned to have almost the entire session available for folks who have signed up. Donna Dean, who is one of the facilitators is trying to determine right now who is here who has signed up and she tells me she can only find a handful of folks, so I don't know if folks are going from room to room and are planning to start at one end and get down here if they know they are later on the list. So if you've signed up and Donna doesn't know you are here, please let her know.

What we've planned to do is, if everybody comes, which is possible, there's time for each person to have about five minutes. So that's what we're going to operate from at this point. If we hear from everyone who has signed up in the time, and we're waiting for folks to come down here, the Committee will resume their work and if someone who has signed up comes in, they can let us know they are here and have their time.

I want to bring to folks attention the ground rules. It reminds people that they need to state and spell their name because we are recording this session, and it describes what we all know about how to work well with others. People are here to listen and want to hear what you have to say.

Joseph G. Miller
North Carolina National Guard
West Jefferson, North Carolina

I was a member of the 1450th Transportation Company, Desert Storm. We helped to support the guys who went out around the corner, the 2382nd, 101st. We basically ran about 107,000 miles out there, but that's history. You people are here to deal with prevention. The website that I prepared at home is nearly two years worth of research and I can tell you who, what, when and where, and I can tell you what we blew up, where we blew it up and who was involved, but that's kind of irrelevant at that point, because it's history. But there's a couple of things, being in the prevention section of this thing, we have to think the unthinkable. By that, I mean we have to accept the fact that chemical and biological weapons are here, they're here to stay, and we're going to have to deal with them. We're going to have to design a weapons system that allows our soldiers to go in and take these things out in exactly the same situation we had over there, with a minimum of exposure. The things we talked about yesterday in your discussion about record keeping, baseline data, all that stuff, is very, very relevant, but it's after the fact. We have to give ourselves an option of not getting into this situation. The weapons systems right now, I can tell

you where they put it and what they used, but right now, we have 100,000 people sick that we know of. This is after the fact, but what I intended to say is, we've got to re-design the way we do things. The weapons system, from what I'm told, the guy who was supposed to be here with me is a chemical warfare expert. He's school trained. He said, the only way to get rid of these things is heat. Lots and lots of heat over an extended period of time. In a wartime situation, the only way to do that is with some of the things that a lot of people in this room don't want to think about, which is napalm, fuel oil bombs, Hades bombs. You have to be able to, I mean, these things are not on the Geneva Convention list, or whatever, but you have to look at something like that to deal with this type of thing because we can't allow this to happen.

The other thing is, in World War I, 98.27% of people exposed to chemical warfare weapons, did not die in the battlefield. They lived for years or decades with residual effects, which is what you see now. That's what this is. Whether you admit it or not, whether you like it or not, that's what it is. My recommendation is the weapons systems and a couple of other things. My problem, when I was over there was that chemical suit. It's not practical. It doesn't work, it takes too long to get it on. One of the primary things is it's made in three pieces, with the boots. It needs to be a coverall type system where you unzip it, you jump into it, you zip it up and you're gone. You need to get into this thing quick. The standard is six minutes. In six minutes, you could be dead in that environment. Thank you.

Alice R. Osherman, MPA
National Coalition of the Chemically Injured
Bradenton, Florida

I'm here as a representative of the National Coalition for the Chemically Injured. I'm their Treasurer. We represent the millions of civilians who have been injured from, in many cases, common, everyday ordinary products, with things that are making us sick. I am wearing a mask because of things such as hair spray, perfume, laundry detergent and so forth and so on. One of the things that we need to have is education of the medical profession so they will understand that we are being made sick by many of these ordinary products. You go to a doctor and they say, 'Well, your tests are fine, so you must have a psychiatric problem.' They do not understand. So we need to start teaching the doctors in the medical field that this is an illness that does exist. All of us that are activists in this field get calls constantly. Our numbers are growing by leaps and bounds, so that's the first thing. We've got to educate the doctors, we have to acknowledge that this exists. Industry is paying much too large a role in this. Money, unfortunately, is affecting all of us, so I'm here to say, please, let's have some education and let the public know that things that they think are safe, really are not. Thank you.

Gina Whitcomb
Desert Storm Justice Foundation
Guthrie, Oklahoma

I am the Executive Director of the Desert Storm Justice Foundation. I want to thank the panel for your work, and I have a question after my comments to get a more quantitative idea of your future roles. I realize that prevention is so multi-faceted as we talked yesterday afternoon about all the different avenues, but some of this can be really, really simple stuff. What I want to point out, and I know there's the education piece of it and the health, but a lot of it, if we would equip our warriors with some basic things that have been proven to make your body more readily able to throw some things off and boost your immune system. We discussed the MRE's, that they have to eat so much of, and they are not balanced, and you're not getting the right nutrition. But a lot of it can be so elementary in the fact that it's been proven if you're deficient in many of the B vitamins, that all sorts of breakdowns can happen, so if they're getting the right food, and I realize because my husband is still in the military, you can't just cart these hot meals out to them in the field, but to improve those MRE's and make sure they're getting the right vitamins.

We have warriors in Bosnia who are ill. They have the same kind of lifestyle. You know, the military lifestyle is really toxic because of all the things involved in the weapons systems and what they do, but as Joe said, there are a lot of mistakes that get made. If they could be addressed, they would prevent a lot of these things from happening. I just wanted to point out that we need to keep in mind some of the simple things; it's not all rocket science and nutrition and vitamins and those things that we can do, and also, how important vitamin C is to us.

I had a question because we talked yesterday about short-term goals and long-term goals and how this workgroup is going to proceed. So my question to you is if you can sort of quantify that and what the length of your mission is, when you expect an ending date that you're going to have a final report, and basically, when your charge is over.

Dr. Melissa McDiarmid, Chair

I'm going to ask the CDC colleagues to say something about the final report. Donna they were saying several months, weren't they? Someone said six months. We're going to have a work product tomorrow before we leave. That's, I guess, not going to be put into glossy form for six months and I don't know what the front end and the back end of that is going to look like, however, I think that one would hope that with the working document that we will come to the meeting with tomorrow, that that will be available. It seems like that would go into the mix sooner than waiting for six months. I'm thinking that some of the things we're going to suggest, this is research, it's not how to fix the whole broken problem, but the research piece of it. Some of the things might be looking at effectiveness of some things that have already been put in place since 1991, so it seems to me that might have a shorter lead time and be more satisfying to some of us who don't want to wait a long period of time. I think we have to be realistic in how long it takes some recommendations to work their way into a request for proposal system. We were told it's basically a long-term, five year project, but the good news is we're starting and maybe there

are some things that are more achievable in a shorter period of time. You were saying some of this stuff is simple stuff and I think a number of us would agree with that.

Dr. Donna Dean

What we need from you and this group tomorrow for the morning session, is this group's recommendations, which as Melissa said, is a list of short-term research recommendations that can be done within the next 1, 2 or 3 years and a list of long-term recommendations that consist of longer-term kinds of projects that can be conducted in 3 or 4 years out. Each of those lists should be prioritized by the working group with some sort of justification for those lists. I would use just an example, without making a value judgement on what Mr. Miller said, if indeed a recommendation were to develop a new suit, then the justification could be, it takes six minutes to put on a suit, you need to think about the engineering design for a new protective suit. That is something that's tangible, that those of us who work for the Government can begin to work on immediately. I would also reiterate for the workgroup Panel, that tomorrow will be the first public addressing of what the recommendations are that are coming out from this report and will be reported back. After the meeting, the Executive Planning Committee, led by CDC, will come out with a report of the findings of the meeting and will capture more fully, the sense of the discussions. We estimate, at this point, that it will take about six months to get that finalized and get it out in press. It will be sent to all attendees at this meeting as well as other contacts that CDC has routinely. Does that answer your question? The working group can clarify or modify anything that I've said. I'm just the facilitator.

COL David Danley, PhD
Commander
US Army Center for Environmental Health Research
Fort Detrick, Maryland

Let me present to the committee what has been put together by our Tri-Service toxicology program on doing research. There's a couple of points that need to be emphasized about developing research plans for a very difficult issue, that is, exposure of our forces to hazardous chemicals. We have research on-going in protective masks, protective suits, nutritional supplements, that are being done by a number of different organizations in the military. We have a lot of research that's being funded under the Gulf War Illness Program and what concerns me and what needs to concern the committee, is, what do you do with all that research. What do we do with all the products that will come out of this research? On the committee you have researchers from the services, and I suppose you think that if you have a researcher from the service, that means clearly that individual will get our products into the services. But each of these individuals represent different organizations, none of which are research organizations, none of which are acquisition organizations.

Prevention is going to mean a change in the military. We've got to effect some sort of change and that change is effected by a number of different organizations. So when you set your research plan up, you have to ask the question, what are we going to do in research, and then where is that product going to go? Is it going to go up in the air with the expectation that someone is going to grab it and do something productive with it? I would dare say, that the biggest failures that we've had and for which we really can be held accountable is why haven't things changed in nine years. Because things were tossed over the wall and there was no one on the other side to grab that product and to do something with it. I see a lot of emphasis at this meeting on low chemical exposure and indeed, it's occupying a lot of our time, but in point of fact, we don't have good research, good protective measures against high-level chemical exposures, toxic industrial chemicals that are being stored in massive amounts in industry. Our gas mask isn't protective against ammonia, the most toxic mass-produced chemical in the world, so we have a lot of problems out there, a lot of challenges. Clearly, we can do research in many, many areas on many different things, but there has to be some sort of prioritization. We have to ensure and I hope that you'll listen to my colleague from the J staff when he tells you that the research prioritizations will be based on threat. If he can't convince the people at the Department of Defense that your research is going to address a threat to our forces, the research will go nowhere.

There are many way that we effect change in the military. Most people in the civilian community don't understand those things. Many people in the military don't understand those things. But, we have to follow the rules and they're the same rules that we use for building jet airplanes and tanks and ships. We have to speak in the language of the military person when we present these ideas. We can't expect them to understand the medic or the scientific researcher. So, in addition to asking the question, 'what research should we do?', we have to ask the question, 'how are we going to take that research and make sure that it effects change to protect our forces in the future?' Thank you.

Dr. Timothy Gerrity

David, you raise a very important issue, and that is, if you will, the transition of research into practice, and how that is done, both practically and also democratically. A couple of things that I think will help to do this; one is, on Veterans' Day of this past year, President Clinton announced the formation of the Military and Veterans' Health Coordinating Board, which is going to be responsible for coordinating a wide number of activities related to deployment health, related to clinical, to research. This also was a major component of the release of the Presidential Review Directive, which was referred to yesterday, which contains a number of recommendations regarding clinical care, research, risk communication, etc. It is going to be the job of this Military and Health Veterans' Coordinating Board to do what you said. And that is to make sure that recommendations that are brought to the Coordinating Board and then worked through the Coordinating Board, then get sent out as recommendations to the Departments. The Coordinating Board has membership of the Department of Defense, Department of Veterans'

Affairs and of the Department of Health and Human Services. So I think that's going to serve as an effective means. We have a precedent for it which is the Persian Gulf Veterans' Coordinating Board with the Research Working Group contained in that, we have produced a public research plan, our directions are being updated right now, we're waiting for some of the preliminary output of this meeting here in terms of recommendations, to go into our annual report to Congress, which is pending. So, I think that the means are clearly there, and the efforts are being made to ensure that what you just said, is done. I think that if we can do that, we'll go a long way towards seeing these recommendations don't end up on somebody's shelf.

Dr. Melissa McDiarmid, Chair

I would also like to assure you that those of us in the occupational environmental health community are very used to this issue. It's been an issue in our community for a long time. Research needs to pass the "so what" test for one thing, and when it does, how does it get implemented? There's an ethical responsibility that we have to get it communicated and implemented. So I think one of the personal hopes that I'm happy about seeing here, is that there are a large number of people from our community that are involved in this problem, I think, in all areas of the problems of Gulf War illnesses. I think that's something we're used to taking some responsibility for. Also, I'd like to say there are a number of folks who are involved in this who have been willing to say in public forums that, or to ask the question, you said we needed to communicate in a language that the military's used to hearing. One of the things I said last year, at a Senate hearing that I testified for, I raised the question, "How is the strategic disadvantage that we experienced through our own lack of preparedness any less hurtful to us than a strategic disadvantage that's inflicted by the other side?"

Janet Dauble, BS
Share, Care, and Prayer, Inc.
Frazier Park, California

I thank you for this opportunity to share my concerns with this esteemed group. I am the Director of Share, Care and Prayer. It's a non-profit organization helping chemically sensitive people, fibromyalgia people and chronic fatigue people. I have thousands of people that I'm dealing with and deal with every day for the last eleven years, full time. I started this support group in 1983 after I had found that my own CIFDS and fibromyalgia and MS symptoms were caused by extreme food sensitivities. This was followed from being exposed to new carpet and insecticides in my home. I was able to come back to life. I thought I was the only one who had this problem, I found out that thousands of people had this problem, and I began to help them as I was helped.

When we knew that the soldiers were going to the Gulf and that they were going to be exposed to the fire, we knew that many people would become ill. We had no doubt about it. When they

came back, and they were ill, we felt terrible because they had the same illness we had, only they had more exposures than we had, more toxic exposures than we had, and they came back more ill than we are. Then we thought, well, we'll be able to help them, they will listen to us, and they will get better, or maybe not get better, according to how severely they were injured. But also, they will be able to help us, because they were a healthy group of people, a large group of people, a cluster of people exposed to very toxic materials and it would be very obvious, it would be undeniable, and because they have the same illness that we had, we would be justified. After all the years of fighting with the government and with industry and the medical field, we would be vindicated along with the Gulf War veterans. However, we were not vindicated and they were not vindicated. When we talk about prevention, we know how to prevent this illness happening in the civilian world, but no one is listening to us.

The EPA found in1987 that indoor air pollution, new carpeting, new buildings, pesticides, is causing multiple chemical sensitivity and sick building syndrome, but nothing is being done. Nothing has changed. Congressman Sanders, wonderful man that he is, held hearings on new carpet. The industry was told they were causing people to have multiple chemical sensitivity and neurological disease. Nothing has changed. I still get calls on the phone from families, from businesses, where people are becoming chemically sensitive. Their lives are being ruined, their vocation is ruined, their family is ruined. It's just terrible every day to be hearing these things on the phone.

In 1997, the EPA got after Dow Chemical because they found that organophosphates in the home, in the office, in your hospital, in your churches, in your theaters, in your restaurants, in your markets, are being applied every month and are causing multiple chemical sensitivity, peripheral neuropathy and neurobehavior, and they stopped them from using it in a few products. It has not been stopped for use in termites and cockroaches. I am still getting phone calls from people whose lives have been ruined by organophosphate poisoning in their home.

When we went through the Malathion spraying in L.A., we went to the government and we told them that organophosphates were causing illness. Surely they would listen to us, surely they would not spray miles and miles of metropolitan areas with Malathion aerial spraying. They did not listen to us. Many, many thousands of people became ill. We had hearings, we had symposiums, we filled out our forms, we went through the EIR, we went through the drafts, we read huge things. Nothing was done. The EIRs went through, and now the government is able to spray anywhere they want to in the southern states without any notification other than a 24 hour notification. Tampa, Florida has just recently gone through this. The people there have gotten sick. They have tried to stop it. There is no way to stop it. When you come to prevention, and this is so important, there has to be somewhere, someone where the buck stops. Someone has to say we recognize that these things are making people sick. Let's not expose people to this. If this committee, with all due respect for all that you are going to be doing, and that we can be assured that there will be change and that there will be products. But you knew all of this before the war.

You were already prepared for chemical warfare. We all heard on the TV that there was going to be some scary things going on, because this war could be with chemical warfare.

Dr. Melissa McDiarmid, Chair

We need to stop, Ms. Dauble, but I think we hear what you're saying. Thanks very much.

COL Eric G. Daxon, PhD, MS, CHP
US Army Medical Command
Fort Sam Houston, Texas

I'm with the US Army Medical Command and Dr. Lum didn't pay me to say this, but I will. There are two things I would like to ask the committee to tackle and the two things are really hard to tackle. The first thing is to define the term, 'low-level' in terms of risk. In working the issues that I am working, one of the things we need to try to do is balance the total risk to the soldier, to the airman, to the seaman. For the folks in the military, it is really easy to understand combat risks. It is very difficult for us to understand and compare the risks from long-term health effects. So, I'd ask the committee, and maybe this is a long-term, short-term. I don't know. Try to define what low-level is and define it in terms of risk, so that we can balance it. It has to be not only scientifically acceptable, but it has to be something that the soldier will accept and the American population will accept or define as acceptable.

The second issue that we're dealing with right now is really risk communication. All of this stuff is very complex. One thing we like not to do, is break faith with our soldiers. We've got to find a way to train our 18, 19 year old soldiers with a high school education, to understand what these risk are in such a way that what we say and how we say it, accurately conveys what the risks are. We're having a great deal of difficulty in doing that at this point in time.

The final thing that would help us all, especially in terms of prevention, come up with metrics that would help us measure success in prevention. Maybe it's exposure reduction, maybe it's reduction in diseases, but one of the things that we always have trouble with when we go to the treatment side of the house, I can show you the number of patients that have been cured, and when it comes to prevention, we've got to come up with some sort of metrics that we can say, these are the numbers of patients that you didn't have to cure. I'm not sure what the metrics are; that's a struggle that's been going on in prevention for a very long time, but from where I'm sitting, I'd like to know what low-level is. I'd like to know how to train it and I'd like to know how to measure success.

Susan Proctor, DSc
Boston University
School of Public Health

Boston, Massachusetts

I'm a Research Associate Professor at Boston University School of Public Health and Medicine and Assistant Director at the Boston Environmental Hazards Center. I basically have three comments, suggestions, two of which were mentioned here this morning, but I just want to reiterate and hopefully give a little more specific suggestions, one of which is education and integrating education concerning health effects of military service, not just from a combat related point of view, but from a civilian or stateside practices. I know that EPA and NIOSH have a joint funding mechanism of funding development of curriculum on occupational stress and there might be some kind of CDC/VA joint recommendation for research on curriculum. I currently teach as a guest lecturer a class about Gulf War illness in the School of Public Health in an occupational health class. It's just something that's started in the last couple of years. The second thing I wanted to mention and it was mentioned earlier, I think it's extremely important to do research on measuring the implementation of certain preventative measures that you do and he talked about the metric of how to measure how successful things are. I think it's extremely important to measure not only the integration of the prevention, but the effectiveness of the interventions or the preventative measures. The third comment is a concern or something that I wanted to point out, people are probably aware of it, but most of the research that I've done on Gulf War veterans have involved New England area Gulf War veterans and a large majority of those people are National Guard members. They're not active duty people. Force health protection I know is mostly focused on active duty and new recruits, but over time for people that join the National Guard when they're thirty years old, the continuing training and education that needs to go on with that group of people, I think, is extremely important. Thank you.

Edward Bryan
Malden, Massachusetts

I'm a Gulf veteran, totally disabled both as a firefighter. I just want to point out a couple of things on prevention. I believe the respirators should have been ordered back in February of 1991, only because of the hazardous smoke and soot condition that resulted from the oil well fires that no one is talking about. The oil well fires hugged the ground. They did not go up and take off into the atmosphere. Don't let Dr. Heller tell you different. I want you to go into the science books. It's called the batch effect vs the chimney effect. It's very, very clear. Everybody has to understand that. The batch effect is the same as when we have our white smoke grenades that are in that military manual for nerve agents. It has the same characteristics. It hugs the ground so that when Saddam Hussein blew up the oil wells, it was meant to hug the ground, not to loft into the atmosphere. Don't let Dr. Heller ride you on that one. I've got a study here on long-term depleted uranium from Concord, Massachusetts. Everyone in Concord and Lexington, Massachusetts has brain cancer, thyroid cancer, breast, brain and thyroid cancer. Very high doses in these areas. I spoke at the meetings up there in Washington, at the National Gulf War Resource Center meeting in September. Nobody is in contact with me about this book. Melissa

McDiarmid hasn't contacted me about this book. She runs a depleted uranium thing in Baltimore. I'm a member of the Boston group and I'm on the [public advisory] committee, and they have yet to take a bone scan of me. I'm on the committee up there and they haven't done it to me. They haven't done a pulmonary function test. I had to go outside on my fire job, to get a pulmonary function test. When are the veterans going to be tested? Dr. Gerrity, can you answer that?

Dr. Timothy Gerrity

That's a clinical question that you raise and I have to defer to the clinical side of the VA.

Mr. Edward Bryan

Yea, but you're the VA. You're one of the top dogs at the VA.

Dr. Timothy Gerrity

Some days I feel like a dog, but I am with the Office of Research and Development, not with Patient Care Services. That would have to be an issue brought up with them, but I would be happy to convey to representatives within Patient Care Services your concerns about this.

Mr. Edward Bryan

Also, I want to address one more point of reference with Dr. Stephen Joseph. Anything that he says, throughout his whole career up there in Health and Human Services has to be discredited. He screwed up the AIDS virus in the '70's, and he screwed up Gulf War illness in the '90's. This is sad. I'm glad these conferences are taking place and I'm glad that I stayed with the Boston group for the three or four years that I've been there. I'm glad I participated in these events and I'm glad that you're here. I'm glad that you people are taking account of what's happening, but I want a yellow ribbon panel with veterans on it to have a blocking thing in here so we can tell you what you're doing right, what you're doing wrong, if it's correct, if it's not. The veterans here are getting very knowledgeable. The Internet is very, very nice, the computers out of the libraries, out of the hospitals, are very, very nice. We can pull up information and bring it to our doctors. That's another thing people are going to be looking at, Internet services. It's just ridiculous that the veteran isn't being taken care of, and I want that strongly addressed. We need treatment, we need care, and the other thing that I noticed with Persian Gulf veterans; I just retired after fourteen years with the fire department. I could retire because it's civil service, but the other veterans, they have no income. They're families, they're almost on welfare, they're in poverty. Certainly, this great country, we should at least be giving them 100% or 50% compensation until you come up with a decision. We want the presumption law, and that's being addressed with the Department of Justice right now. We want this on the floor in Washington immediately and we want the VA to remove it from the Department of Justice. Thank you. Any

questions?

Dr. Melissa McDiarmid, Chair

Mr. Bryan, I just want to say a couple of things. If you want to be tested for depleted uranium, any veteran in the country has the right to go and be tested for depleted uranium.

Mr. Edward Bryan

But they don't know that, Dr. McDiarmid. They do not know this. I would like it put in USA Today, the New York Times, the Washington Post, CNN, right on CNN's screen.

Dr. Melissa McDiarmid, Chair

Please let your colleagues know. I don't know how the VA communicates that.

Mr. Edward Bryan

No, we want the government to put it on CNN.

Dr. Melissa McDiarmid, Chair

I don't think they'll do that either, but anyway, please let your colleagues know that anybody has the right to be tested for depleted uranium, getting a 24-hour urine, having it go through the same program that our folks go through.

Mr. Edward Bryan

Don't forget the long-term study on depleted uranium.

Dr. Melissa McDiarmid, Chair

Okay, and the other thing I wanted to mention and I think you have a very good point about, and that is the issue of respiratory protection. I think that's something that our group can deal with. Military respirators are not NIOSH and AMSHA tested and approved, and that is something that in my OSHA days, I was concerned about. So I think that's a more easily addressed issue by this committee, and I appreciate that you brought that up.

Mr. Edward Bryan

And again, no firefighter has spoken about the Gulf War. No firefighter, just oil well drillers. I'm

surprised that no firefighters have come forward. I'm just surprised, I'm disgusted. Thank you.

Dr. Melissa McDiarmid, Chair

We have gone through the list of everyone who has signed up ahead of time, and we're planning to use the remainder of the time to continue our workgroup work, however, I understand there are one or two people who want to make a brief comment, even though they haven't signed up, so we will hear from those folks and then our group will continue with their work.

Dalia M. Spektor, PhD
RAND Corporation
Santa Monica, California

I think an idea that needs some attention, because there is a lack of knowledge, is how, because you have prevention, what do you prevent for and at what levels. The data available is either for ambient exposures, for general population which includes children, senior citizens, the elderly, the sick or from an occupational exposures which are only 40 hours per week, and then there is a period of cleaning, of removal of exposure, or elimination through other processes. There is no information in the literature for healthy, young or mostly young, 20 to 40, whatever the range, that are exposed to many things for 24 hours consecutively for several months. I think that idea needs a lot of attention, because if not, we can extrapolate the wrong way. That's all, thank you.

Dr. Beatriz Orduna-Salisbury

My suggestion is addressed to the issue of medical surveillance for our troops and relevant to what was discussed yesterday about the lifestyle approach that the DoD is taking now which I assume is now actively on-going. Key words that I would like to put out, that some research, if this is not done, is standardization of medical surveillance. What I mean is standardization of issues or items that need to be in the content of medical surveillance, the standardization of the frequency, etc., the methodology of it, but also they should have input–multi-agency and multi-expert input, not just the DoD staff doing this, but maybe a collaborative effort with CDC with the NIOSH branch, with the National Academy of Sciences and Institute of Medicine input, from the VA with input from the DoD and of course, we understand it's not simple to do this. Sensitive information or issues need to be looked into, but the issue of how to reconcile access to the data when the soldier or the veteran is ill, whether he is still active duty or already a veteran, that this information should be available holistically. How to go about that if there are classified situations in the past history of the soldier, leave it up to the DoD and the other agencies to iron that out, but there must be, somehow, access to the medical information and the nuances, we'll leave it to the intelligence or units or whatever. I noticed it was brought up yesterday in the Veterans' Forum about this information, classified, etc. I want to say that education, information and education is really prime starting from when recruitment is done, and the entrance orientation

is done.

Short range is, could we review what our directives in the DoD or VA impact as a deterrent or as a facilitator in doing this medical surveillance, like what I mentioned yesterday, none of the attention is towards an exiting soldier in their exit medical examination, which I really feel is very important. It should be comprehensive and it should be done, but that is really part of your life cycle approach. In other words, make that life cycle approach very comprehensive from entrance, up to exit, up to he becomes a veteran, up to he dies. That's what I mean by medical surveillance.

Dr. Hendrik P. Benschop
TNO Prins Maurits Laboratory
Ryswyk, Netherlands

I am out of the Chemical Toxicology Department of TNO research laboratory in the Netherlands. It's interesting for you to know that not only is there a lot of worry in the United States about deployment toxicology, but also in Europe. We are setting up a NATO workgroup now, which will attack the same problem. We will have our first meeting in about two weeks time in Paris and Cologne. Then we will be one of the two US representatives in that group. What we are going to do in our first meeting, in NATO language, we have an exploratory team. The exploratory team has to make a survey of what is going on in the various NATO countries in this area, and then set priorities for reserves. So that looks very similar to what the CDC group will have to do, so I presume it will also be interesting to have some kind of liaison between this NATO group and the CDC group, to keep in touch on our priorities. I will be the Chairman of that group, so I would be pleased to communicate with your group. Thank you.

Dr. Max Lum
I have a comment. Joseph [Miller], you mentioned your website. Could you just briefly tell me, what is it, what do you use it for, who looks at your website?

Mr. Joseph Miller

I set up the website about two years ago. It's basically therapy for me, because I had a lot of the health problems, I had a lot of that stuff, and I didn't accept stress as the primary cause, but I noticed in setting it up, that a lot of the stress was relieved by reading and studying and understanding what actually happened. The purpose for setting up the website site was, I had people in my unit that I could not keep in contact with, per se, so I set the website up for it to be there for anyone to go up and read it and look at it. I used the government documents. By that, I mean I used the [Presidential] Advisory Committee report, the Riegle report, the GAO analysis, I've got updates from his office, I think a couple of times he sent me information on it that I've written short updates for and put it on it. I put it up there so people could go and read it and

understand it and realize that there is a problem and that there is help out there. I've got 800 phone numbers for the Office of the Special Assistant, the DoD hotline, the Veterans hotline, all that stuff is up there. I've got links to both houses of Congress, all the representatives, I've got a link to CDC, I even went the other way. I've got government sources, I've even got some of the radical sources. I've got Joyce Reilly's thing on there. I think you people are familiar with her. I've got it on there. I've got a lot of that stuff. But my purpose in putting it up there was to give people a place to go to, to look and read this in a very short form. Unfortunately, it's not very short form anymore, it's like 3.2 megabytes now. It's huge. It takes several hours to read it. The last update I put up there was on the explanation the CIA put up on what happened at the pit. I mean, dates, times, what munitions, how the charges were placed, all that is on there and people doing research into the issue can read it in a short, synopsis form without reading 500 pages of material, which is what I had to do to put it together.

The reason I said what I did this morning about the weapons system, is because you people here, that is the most terrible thing in the world, to have to think about using napalm on something or something like that. In my mind, there is no excuse for it, but it's like I said this morning. These things are here, they are here to stay. The reason I say that is because the Chemical Warfare Convention of 1921 was not ratified in the United States for 50 years. It was ratified under the Nixon administration. We signed it in 1920-something, but it wasn't ratified in the Senate for 50 years. If you people, you need to discuss methods of destruction of these things, and you need to set up a doctrine that these things can be developed, but absolutely, positively, the only way this type of weapon can be used, is in a situation involving a specific other situation, because if you do anything else, it's just as inhumane and bad as the things we're dealing with. I kind of got off the subject of your question.

Dr. Max Lum

That's alright. I have other questions, but maybe I can catch you in the hall about your website. I just mainly am interested in the electronic delivery of information, why people go to your site, but maybe we can talk in the hallway if that's okay with you.

Mr. Joseph Miller

[Unidentified person asked for website address]. It's a long one. It's www.geocities.com/Pentagon/9754/index.html). I realize that's a long address. I spent a lot of money doing research and running. I don't have as much in the website itself as I could have, because my Web master is also a veteran, he did three tours in Vietnam, he has Agent Orange exposure, it's going to kill him, and he believes in what we're doing and he donates the time to manage the site for me. So, thank you very much.

Dr. Susan Proctor

In the CDC-funded study we're doing, we have a community of veteran advisory groups that we meet with periodically to talk with about our research, and I think whatever, not just this workgroup, but any workgroup devising strategies, I think it's really important to include the veterans and other related people outside the research realm to talk about what works, if you want to know what preventative strategies work, what doesn't work, all those types of things. I think it's extremely important.

Ms. Gina Whitcomb

I want to echo the gentleman about when you do the research for the prevention, if it doesn't take place and it doesn't get pushed down to where it needs to go, then we've all wasted our time. And this is a follow-up comment about your comment, Dr. McDiarmid, about the VA hospitals and the veterans can get their DU test. It really doesn't get pushed down properly; I've had a working group forum with the VA hospital in Oklahoma City for several years and over a year after the protocol of testing was first developed for June 1994, I had to take a copy of it to my VA hospital to the Chief of Staff, who knew nothing about it and was not using it. I got a copy of this DU testing, the VA directive, to the hospitals, explaining who can be tested, why, how to go about it, where it goes, all that. I had to provide that to my VA hospital. It's not getting pushed down, and that's very, very important. I just wanted it for the record. Thank you.

Dr. Melissa McDiarmid, Chair

The latest push VA-wide, the availability of being tested for urinary uranium and re-communicating that, is only about a year, a year and a half, old and just to let you know, I think a phenomenal education went on about that. They had a big satellite network presentation and every VA in the country was supposedly plugged in on it. However, as you know, we all either know, work with, have members of our family, whatever, who don't exactly represent in the greatest way, people we'd like to work with. There's going to be breaks in the system. I can also tell you that my office has personally fought those fights you're telling me about, individual VA's, when frustrated vets have finally given up and called our 800 number to say the so and so VA never heard of this. And then we call up, and indeed, we get someone who acts like they never heard of it and we kind of explain life to them. So, these things happen.

Now, the denominator is however, that's there are what 163 VA's, and multiply that by the number of people who are going to pick up the phone and answer it, it's unfortunate that the quality of the answer you get is the function of the person who picks up the phone. None of us can do anything about that. We're going to try to do better, but we all, like I said, folks that we work with that you cringe when they answer your phone. These things happen. I appreciate that feedback and we will continue to try to communicate that to people. I know you're right, but I also need to tell you that these guys did a Star Wars type attempt at getting the information out and in fact, beat the DoD in getting the information out, so I was kind of impressed with that.

Dr. Irving Cohen
Topeka, Kansas

I'm not affiliated with anyone. I'm a retired VA physician and your comments cannot go without an answer. The communication hookup is a joke. It is high tech, it works wonderfully most of the time. You get theater-size screen at the VA that I was at, and you have two people attending, none of whom are charged with the responsibility of anything to do with Persian Gulf syndrome, but I would attend because I was interested in seeing patients, even though that wasn't my official function, and one PA, when he could get off, he could attend, and any hour that we attended, of course, came out of our patient care schedule, which meant that we went home later that night. So, the communication system is not the answer. The answer is to get the people that need to see it, in the room, whether it's somebody with slides, or a multi-million dollar Star Wars system. Thank you.

Dr. Timothy Gerrity

In response, or actually, in addition to all the comments that were made, which I think were absolutely appropriate and on target, is that the continuing challenge that faces the VA in regard to the Gulf War veterans, has been both to get messages out, and also to work to ensure the messages, when they are sent out, get received, which goes to what your issue is. We are in the final stages of developing two new treatment trials. They're about ready to be, as we say, kicked off. That is, started, start to enroll patients and we have obsessed on ensuring that the lines of communication would go from the veteran to the local study site when they get a phone number to call so that when someone picks up that phone, they don't say, we don't know what you're talking about. So we are acutely aware of this and are making every attempt to get the word out to veterans that if they want to participate they can, and that information is going to be widely disseminated very shortly, but also to ensure that health care providers and hospitals also know about it so they can authoritatively answer questions when they come in.

Mr. Joseph Miller

The problem that I've seen with communication on this thing is, in the beginning of this thing, three, four, five years ago, we had a lot of publicity about the Persian Gulf syndrome. News reports, magazine reports and that sort of thing, and there was a lot of communication, a lot of news reports on it. At that time, we were saying, it's all stress, it's all in your mind, and there's a lot of veterans out there having minor problems, and they're basically turned off to the system. They're just not listening, not interested. Those are the people we've got to get to. Now, I understand Mr. Rostker's group, they started a liaison problem that they're working on now, where they go to all the posts, but we need to put pressure on the chain of command in the Army reserve, the National Guard bureau, the Army bureau, to send a memo down through the chain of command about their outreach program. Tell them where they are, when they're going to be

there, give the dates and give them out in the morning formations for the units themselves, so the units know about them a month, two months, in advance. That way, we can get the veterans back in the system. That's the only way we can get our credibility back. We've already fumbled the ball, now we've got to get down on the ground and get it back, because otherwise, we've got a major problem. Thank you.

Dr. Max Lum

I think in our review of the PRD5 effort, you're right on target. That's a major problem and I'm interested in talking to you about why people come to your site, for instance. Why do they not go to the VA site? Why does that happen? Is it because they trust your information? Probably. That would be my guess, or they know your site. But I think those are the issues. Those are serious communication issues that we have to talk about. That's the coming back part of communication. It's not the going out part. I think we've got a good handle on the going out part. It's, how do we know what people are doing with the information, are they satisfied, and if we're not reaching them, it's ridiculous to put information on an electronic system. One of the recommendations, I don't want to take too much time, one of my recommendations will be somehow make sure that this committee takes a look at the recommendations in the PRD5 report, either a smaller committee rather than pick through it and pick out things we like, is that we have some way of looking at the recommendations to highlight what you're saying. We even thought about using librarians, because they're a trusted source of information in our communities, but they don't know anything about this issue. But they could help somebody get information, because they're great at website management issues. Microsoft really is loading up every library in the country with computers, which is their goal within 24 months. I mean the system is sort of there, if we wanted to work that system. It's a different sort of approach, but I mean, we really have to deal with that issue. You're really on target with that.

Mr. James Tuite

A lot of this has to do with execution, which is the point that I brought up yesterday, and the quote Congressman Sanders made about confusing motion with progress. If we don't have some suitable form of management controls, not to show that we're doing something, but that what we're doing is effective, have we established procedures, do we have a procedure for conducting routine internal audits to make sure those procedures are being followed. When they're not being followed, are we conducting investigations to find out why, and if the procedures need to be modified, doing quality control on the level of those procedures. Then, having some mechanism of enforcement to make sure this happens. All of the plans that we make will be just like all of the plans we've made before, unless that becomes our first research priority. To be truthful, this is not a new concept. This is the way the FDA regulates the biologics industry, it's the way OSHA works, it's the way a lot of the agencies work to ensure these things happen, but it doesn't just apply to hazardous workplaces. It applies to communications and many other areas where we

have to deal with a quality management plan and I think that's where we are falling short. We're not really falling short in what we write down on paper about what we're going to do, we fall short when we actually have to do it.

Trish Boggess
Oklahoma Department of Health
Desert Storm Justice Foundation
Oklahoma City, Oklahoma

You were talking about getting information out to the veterans. In 1997, the legislature passed a law in the state of Oklahoma to put together a committee of people to educate and reach the veterans in the state of Oklahoma. We have over 14,000 Persian Gulf veterans in our state and we have started sending out surveys to find out how ill our veterans are and be able to better educate them. We have a website, which they come to, we have posters, and there are toll-free numbers for them to call. I only know one other state that has anything similar to this. Illinois has a committee, as well. But as far as educating the veterans, we have taken it upon ourselves to, instead of trying to get them through the VA system, we have compiled a mailing list and we personally mailed about 14,000 questionnaires out to try and locate the veterans and get information out to them.

Dr. Melissa McDiarmid, Chair

You're with the state health department?

Ms. Trish Boggess

Yes, and I'm also with the Desert Storm Justice Foundation.

Dr. Max Lum

What was the motivating factor that set that up? Did you have a congressman or a state governor?

Ms. Trish Boggess

Yes, we had two state representatives who came up with House Bill 1239 and put it into motion and got it passed. The state veterans' council was also behind it.

Dr. Melissa McDiarmid, Chair

The group is going to continue where we left off yesterday and if anybody sees anybody come in

who they thought signed up, please bring it to our attention so we can hear from those folks. Donna took my notes from yesterday and cleaned them up, and the committee members have a copy of it. Since we have only two more sessions and we're supposed to actually have done something by tomorrow to share, we were thinking of using that final page where I put several of the slides together as a template for a way to organize what our recommendations will be. I think Tim was the only other person who had a paradigm for that and he thought that it was alright to use this one, although I asked him if he wanted us to use his.

What we thought we might do, is use this as a template and then go through and expand and explode each of these areas with real discreet, specific examples. We heard a number of them from the audience today, and I can see fitting them in. Chemical suit is one and having the military look at their specs for respirators is another one, and having them tested by NIOSH and AMSHA which is what the rest of the world has to do. So, I guess I'm asking the colleagues sitting here at the table, are you comfortable with us doing it this way?

Dr. Timothy Gerrity

Just one question, the answer may be obvious. We are starting with the presumption that the generic threat that we're dealing with indeed has been identified as a threat. What I mean is that one of the problems that is faced with future deployments is identifying those agents which are potentially threats. Then, having identified those, what are the prevention measures associated with each of those.

Dr. Melissa McDiarmid, Chair

I would agree, we don't know what all of that list is, but we're not even handling the ones we know, very well. So at least in terms of a place to start, we've identified and heard for the last two days, a fairly well characterized list of potential toxicants and we're not even handling those correctly from a classical, public health, careful occupational health point of view. So on the one hand I empathize with the fact that the environment's not fully characterized, but on the other hand, let's not wait for that, because there are known successes and interventions that we can put in place and recommend right now that haven't been done, and I think we've heard colleagues in the audience say that too. So, that's a frustration, as well, so I'm for picking the low hanging fruit first and I think that's where we should start, don't you think?

Dr. Douglas Rokke

I think I agree with Melissa, however, there's one thing that we've been discussing pretty much in depth for years. I'd like to suggest that the panel request a complete release of all the classified information that was known at Desert Storm with regard to toxic industrial chemicals, nuclear, biological and chemical agents, the endemic diseases that we saw in the environment, the

industrial agents and toxic materials that were used in the involvement of all the processes and the maintenance activities. I'll give one example–the CARC paint that was used to prepare our vehicles for decontamination. I'd also like to make a suggestion that the panel get a complete release of all of the information. The information was available. Now, in order for us to begin treatment, care, prevention, anything, Tim is right, we have to know what was there. However, at this time, having been there, having done this, and for those of you who don't know, I did a direct briefing for the medical management of chemical and biological casualties in theater. That was my task. And that's still classified and it's going to be there until VA de-classifies it or the Department of Defense de-classifies it. Prevention, treatment and care are dependent upon the full release of information. I think this committee needs to request that in the strongest term possible, because then once it's out, we can begin the strong task of prevention. Dr. Daxon's absolutely right. We have to look at the risk. We have to look at what it is in comparison, but without that knowledge, we can't do that. So I guess that's a big charge. It's a request that the committee has put forth all the way to the CDC and NIH and everyone involved to where they go to DoD and all the foreign nations; we've got the United Kingdom and Canada represented here, and we need to work together with all the members of their staff. All that information has got to be released. That's my recommendation. From there, I think we can succeed, but without that information, no matter what we do, we'll be limited, and the credibility of any work that we do will continue as we've heard from everybody last night in continuation from the vets.

Ms. Alice Osherman

We've got to get rid of trade secrets. Until we can get that in so manufacturers really tell you what's in their products, lots of times you are not going to find out what is in them.

Dr. Melissa McDiarmid, Chair

This is for the folks in the audience, a summary slide of where we started yesterday, with some of the review material and I think what I heard people agree to do is, fill out under that outline, where we would place some specific examples articulated by you all, also some that folks around the table have got some concerns about. One of the reasons we're putting it like this is as somebody said, in order for the military to understand we have to be able to communicate with the military in language that they understand, and in order for the agencies that maybe are going to fund these, if we can prioritize them the way the public health agencies, one would hope, would prioritize requests for proposals, to make it clear which pieces of public health priority setting and prevention and research needs they would be fulfilling by issuing a request for proposals in a certain area, it might smooth the way a little bit. And then Donna, your direction to us to include a rationale for our recommendations tomorrow, well we might just be able to add a column next to that one on the right, and just say, well the reason we're talking about chemical suits is because it takes too long, the reason we're recommending the way respirators are tested, is because they don't have to jump through the hoops the way the ones in private industry have to and they might

not be as protective. Now, if we didn't have a group wanting to participate in this with us, I'd probably divide the group up right now into smaller groups to work on subsections of this, but I want to make sure this is an open process. So, are there recommendations on how we can work on this in pieces and still include the folks that want to be included here, in terms of watching and listening?

Dr. Douglas Rokke

Let's just start at the top and work right down with everybody's input.

Dr. Melissa McDiarmid, Chair

Where this title, *Prevention of/Preparedness Against Chemical Exposures* came from is one of the initial tasks that was listed for this group by the planners, and really, that's the kind of lumper, if you will, task that everything else they've asked us to do came under. So really, that's the umbrella task under which we can work. So shall we just go down the hierarchy of controls and see where there are specific examples that fit in? So we'll start with substitution? I just want to say one thing. Remember everybody, help us because our job is not how to fix the whole thing, our job is prevention. So you've got to try to think through the recommendations, so it would sort of fit that way. So task force members, are there specific suggestions here?

Dr. Douglas Rokke

I think on substitution, what we need to do is conduct research to identify substitutable chemicals that have a reduced toxicity or no toxicity and that can still provide the end result that's necessary, so whether it's a CARC paint or something like that, or if we're doing solvent de-greasing, to identify something that, if possible, in the mission can substitute for or reduce the hazard.

Dr. Melissa McDiarmid, Chair

I think the example that Dr. Spencer gave yesterday about maybe choosing a less toxic salt for pyridostigmine than a bromide, that's kind of an interesting suggestion.

Mr. James J. Tuite

Another thing that we should probably look at is restricting the number of pesticides that we use. We have many pesticides that are just duplicates, you could use one or the other, and with the problem of synergy, by introducing fifteen different pesticides when three would do, you'd minimize the confusion that you're going to have on the other end when you're trying to look for etiology or puzzle factors.

CAPT Michael Kilpatrick

I think part of that would go into following on this research into as far as transportability, duration, what kind of application needs to go on and to put that terminology we heard earlier here into the context in which the military person is deployed. Not the eight hour work space or the daily shower, those kinds of things.

Dr. Melissa McDiarmid, Chair

Just a second, I want to clarify what you are saying. Are you talking about exposure limits?

CAPT Michael Kilpatrick

I think under substitution, it's following on figuring in a substitution way, which are the pesticides that should be utilized, and then going from there and the research that would be more as far as the OSHA standards to look at, the work limits for pesticides.

Dr. Timothy Gerrity

I think that one could apply this more broadly than just pesticides in terms of, I don't know what you want to call them but, appropriate needs assessments for any number of industrial occupational chemicals that can be present during a deployment out in the field, both in terms of what's sort of the minimum use necessary to achieve a defined endpoint, sounds simpler than it really is, and also identification of appropriate substitutes as has been said for existing ones.

Dr. Jack Heller

I agree with the idea of substitutions. One of the things we need to look at, and I wish I was an expert on all the things DoD does, but we do have a whole pollution prevention program in DoD, in the Army Material Command that looks exactly at, for industrial activities, trying to substitute less toxic, less persistent materials in some of the things we do. It's something I think is a good research effort, but like Colonel Danley said, I think sometimes it would help when we make these, to be aware of what goes on in DoD now and not to be redundant, but maybe make recommendations to augment things that are already going on and hopefully fairly efficient.

Dr. Henry Anderson

I just wanted to add in the substitution area, while toxicity is important, I think it's also important we look under the use conditions so that it's much more critical when you're in the field in temperature, that you look at skin absorption issues, where a lot of the standard toxicology is inhalation and ingestion, so I think some of the toxicity may be different, not just on the pure

product, but how it's used. The same would be for repeated application, what is the persistence of the material or the chemical? You don't have the benefit of work clothes or maintenance in the field so that if you get saturated with solvents or gasoline then that's your clothing for a given period of time. So I think it's important that we look at not the direct translation from the US industry experience and research, but actually under military use conditions, specifically, and I think that could be a focus of research on the substitution issue, which you use taking those kind of extreme conditions. We look at that in the equipment as cold or hot gaskets and things like that, and temperature, but I don't think we look as carefully at chemical use and the toxicity under those conditions.

Dr. Timothy Gerrity

I just wanted to make a comment because I think it's easy to drift into non-research areas and issues such as optimization of utilization. That's probably mostly non-research, it's just using good judgement in terms of what one does in an operational arena.

Dr. Melissa McDiarmid, Chair

I think that's about where we are right now. I think we're making a good start and we will continue our group this afternoon where we left off and if folks in the audience have a . . .

James Pirkle MD, PhD
Assistant Director for Science
Division of Environmental Health Lab Sciences
National Center for Environmental Health
Centers for Disease Control and Prevention
Atlanta, Georgia

Can I just say this, because I'm not sure I'll be at the next meeting. I want to jump down the chart to the biomonitoring section. We have a fairly large effort going on in our laboratory in the biomonitoring area, probably trying to develop methods so we can rapidly assess exposure to 150 toxic substances, many of which would be likely used in the field, within 48 hours. We're working with Jack Heller on some preliminary studies which I believe he mentioned yesterday, to look at feasibility of using these during military deployments. But some of the agents that would be in what we call a rapid toxic screen, are some of the major chemical warfare agents, nerve agents, lewisite, nitrogen mustards, sulfur mustards, hydrogen cyanide, saxitoxin, Ricin, and things like that. In addition to that are a series of toxic chemicals which would include at least 45 different pesticides, both non-persistent pesticides and organochlorine pesticides. Also in this process, we are looking at storing the specimen after an analysis took place so that if other theories came along where people thought maybe the level of pyridostigmine, or something like that, would be important, we'd be able to make selected analyses in the future that would not

have been known in the past to be important. It's a very major commitment of our lab that we are very much working on in the terrorism side as well, so it covers a lot of different ground, but it's something that's going to be practical in not too long a time, probably by September we'll have at least 50 chemicals on board for such a screen and it is something when you're looking at metrics and milestones and saying, have things happened and can we document whether exposures are more or less. These are quantitative measurements, not positive/negative measurements, which actually quantify very well and it's the kind of thing that would lend very well to the metrics and accomplishments you're trying to document that you've, in fact, reduced exposure to your personnel. So both documenting exposure, excessive exposures and effectiveness of interventions that reduce exposures is where that would come into play.

Dr. Melissa McDiarmid, Chair

We will continue working this afternoon and tomorrow morning, but at the end of each session, as appropriate, I will look up, and if there are hands waving at me, we will acknowledge and ask you to contribute to the list. Is that fair enough? Okay, thank you all.

The session is adjourned.

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Day 2 – Monday, March 1, 1999 - Afternoon Session

Dr. Melissa McDiarmid, Chair

We're going to go through the major elements of this hierarchy of control. We were talking about substitution right before we went to lunch. I also want to assure folks in the audience that the last 20 minutes, we are definitely going to get to you so you can keep us honest in terms of anything you think we're not covering. I also need to remind everybody that this isn't a way to do everything better. We're supposed to be recommending research recommendations, things that are supposed to be resourced so that they can be pursued and they have to be in this prevention area. I think we were getting a little bit far afield this morning but I think there is a way that we can work to tweak a recommendation of how to do something better and still get it into that format of it being a research recommendation, but I just want to remind everybody that that's what the task is. Why don't we take a look at the substitution issue because that's what we were working on and Donna kindly over lunch put this together for us.

Dr. Henry Anderson

I don't know where it goes, but after listening to the afternoon presentation as well, somewhere in here I think we probably have to suggest that research needs to be done to study why the current SOP's aren't working. Then I think we can have the substitution of pesticides, but if the current operating procedures for those aren't working, or the education or something isn't working, we really need to identify where the breakdown occurs and try to determine why it isn't acceptable and try to work around acceptability types of issues. I think that may be an overriding theme throughout the whole thing. When we get to the biomonitoring, it's not acceptable to have your blood drawn frequently.

Dr. Melissa McDiarmid, Chair

So is that a nuance Henry when we get down lower on this priority list? It's a work practice thing? [Agreement from panel members and audience]. People that have pet things they want to make sure they get on this list, keep something written in front of you. This is the way we're going to do it. We're going to go down the hierarchy, but I don't want to lose these issues. Sometimes it's hard to say where they enter in but they do have relevance in a lot of different areas. Are there other things specific to research issues and substitution?

CAPT Michael Kilpatrick

I think there may be an area where we could look at vaccines. Currently we have one vaccine for one disease and there certainly has been combinations, the MMR, some other pediatric vaccines, being able to be put together so there aren't so many shots, and I think there may be an area for what kind of vaccines can be combined, looking at potency, where it would have to go back through the FDA for approval of a new vaccine, but I think the science has to be done first.

Dr. Melissa McDiarmid, Chair

So would that be a bullet point?

CAPT Michael Kilpatrick

I think so, under substitution. Because if we have one shot that gives you three or four coverages, than you've got less opportunities to get it lost in recording.

Dr. Melissa McDiarmid, Chair

Okay. So might some of it also be that there's more than one way to, it's not just an issue of how we're grouping vaccines, but maybe to re-look at some of the existing ones?

CAPT Michael Kilpatrick

I think so. Probably look at the whole vaccine process. Those that require annual boosters, technology as present, it should be more like four to five years.

Dr. Henry Anderson

Or the three series of shots a month apart when the people are moving and you can't follow them.

Dr. Melissa McDiarmid, Chair

Also, driven or nuanced by field experience. So the way I would write that is around that research issue content versus process. So the content would be more the toxicology driven issue, but then how things get translated into the field, or don't get translated into the field or fielded very well, and I think both of those issues are around what you said, Mike. Other comments up here? We're going to take comments from the group at the end so I know it's frustrating, but write down your comments and you'll be able to go to any level that we've discussed. Let's talk about vaccines first. Any comments about vaccines? No? Any other issues under substitution? Henry says it's a good start so, I'd like to try to get through this once this afternoon so that tomorrow morning we'll have a chance to fine tune it again. How about engineering?

Dr. Douglas Rokke

On engineering, what we might want to do is look at the evaluation or redesign of the equipment that we can reduce the need or use of various industrial hazardous materials.

Dr. Melissa McDiarmid, Chair

Doug, any examples? This is the one that I had the hardest trouble thinking of something.

Dr. Douglas Rokke

Say, for example, if we wanted to use some organic solvents for de-greasing on a truck part. Is there a possibility that we can re-design the piece of equipment so it reduces the amount that's necessary to complete the de-greasing process. So instead of having a big tank that's holding ten gallons, maybe we go down to a three gallon tank or make something that still permits us to get the thing clean.

Dr. Melissa McDiarmid, Chair

Is this more of a work process?

Dr. Douglas Rokke

The engineering process is the re-design of the equipment. Work practice is what we do.

Dr. Melissa McDiarmid, Chair

Mr. Tuite, you had a lot of comments about the way things are done. Can you weigh-in here?

Mr. James Tuite

I almost think that falls into the category of how we execute the administrative aspects of it, and maybe the administrative head should have an over coordinated view of how we do all the other things. In terms of Engineering, I think what Doug's trying to say is that we might look at the way we produce things. For example, I know when customs service bought ray domes to do surveillance like the AWACS. They got this million megawatt dome on the top and they put them on P3's and of course, they've got overhead windows, and the pilots were getting fried through the windows and they eventually figured out a way to deal with that.

A lot of times we field equipment for which we haven't looked at the engineering to minimize the hazards to the troops. So this becomes very complex. This becomes almost an ergonomics type

of a situation. We have to start looking at how we deploy things. We have to look to make sure that safety measures are addressed before we introduce something into the arsenal, whether it's the pesticide arsenal or the equipment arsenal. In a chemical laboratory you actually have to get a permit that shows all of the concerns have been addressed, so that should be a concern on introduction of equipment. Certainly, if you can retrofit equipment, that's also the case, but prior to introduction, now this becomes very difficult in terms of research, because you're really looking for someone to provide you with an overall plan that's not tailored to any specific piece of equipment. That becomes a very difficult task.

Dr. Melissa McDiarmid, Chair

We're also talking about a comprehensive safety health plan here. I think we need specific areas that need to be looked at in engineering.

Dr. Henry Anderson

It seems to me that there's one thing that has also been through the conference, and that's the issue of depleted uranium, so I think one kind of engineering thing is, it's a very effective munitions, unlikely to be substituted soon, so I think we really need to look at, from an engineering standpoint, you know, the purpose of this is to destroy inanimate and animate objects, and you're going to have to then clean up and transport. I think an Engineering issue would be understanding you're going to have contamination. How do we protect the transport? Do you transport and de-contaminate off-site? A lot of this has been looked at, but I think another look at what are unique contamination issues after the battle's over.

Mr. James Tuite

A research item might be an evaluation of the adequacy of the way the military looks at these issues. Are the procedures and processes they use adequate to ensure, not that it's safe, but it's the safest it can be given the constraints of the military environment.

Dr. Douglas Rokke

Well in the containment for that, what we had to do was we wrapped it up like a Hershey's Kiss, so the engineering would be trying to determine some type of packaging material to provide adequacy of protection for everyone involved. Any type of contaminating equipment. It's engineering packaging.

Dr. Henry Anderson

And durability. So that you load it and off load it three times and your Hershey's Kiss is blowing

off across the Desert.

Dr. Douglas Rokke

As most of you know, it all came off.

LT COL Philip Bolton

We've mentioned depleted uranium, we haven't actually got proof that it's doing damage yet, so let's not go too far down the route of throwing the baby out with the bath water. I mean, it's a concern, but are there actually health effects from it?

Dr. Melissa McDiarmid, Chair

Well, happily, that's not what we're going to take up here.

LT COL Philip Bolton

That's just caveat because we mentioned a specific one. I mean, yes, I take the point that we've got to try and make everything safe for our personnel, and as humane as it can be in the messy business of war, but let's not get diverted from the military requirements.

CAPT Michael Kilpatrick

Let me just make a comment on DU and then come back to the Engineering area. The DU, I think we certainly of the mind set that we're going to have it coming at us from the other side next time, and I think that comes more under the medical biomonitoring that we need to do the research on. How do we do that in deployed conditions, because taking care of a DU injury in a hospital is a lot different than 50 miles from anywhere.

Dr. Douglas Rokke

I think we're dealing with stuff, we're not looking at specifics. The engineering practice is anything. I mean, we don't want to get cornered down on one thing.

CAPT Michael Kilpatrick

But the engineering, I want to come back to that. I think we want to do research on what we're doing for heating, cooling and cooking and those basic kinds of things that are going to be military life, so that we're not contributing, minimizing contribution to pollution. We talk about kerosene heaters, which is probably one of the most archaic ways of heating. But what else do

we have? That's sort of the engineering that Doug's talking about. Where do we go to change the equipment that we take with us? And that kind of basic research needs to go on. Where are we with using sun or those sorts of things that we could look at. That's what I see as a research need.

Dr. Jack Heller

I realize a lot of these things need to be done, but like Colonel Danley said before, we have like a man print and a health hazard assessment program when we develop a piece of equipment, looking at everything from crew safety in a vehicle to disposal and I think what would be really good is if, we're going to make some research recommendations, but one of the first things that we have to look at is what's being done now. I hate to make blind recommendations without seeing what's being done now and unfortunately, I can't speak to all the things that are being done. I know we are continually developing new can heaters and other new pieces of equipment. I wish somebody from that group was here to talk about what's being done and maybe this group, with some research recommendations, could adjust the impetus. I think we'd get a lot more bang for our buck now doing that.

Mr. James Tuite

I think that's what I was trying to suggest, that we look at the process that we have in place right now. We've got universities that specialize in safety engineering, that could possibly compete with this kind of research grant. Actually look at what we're doing now to see, is it the best we can do, given the constraints of the military environment? Obviously, we can't go directly to the OSHA model, because it's not a commercial workplace, but these folks can come in and look at some of the things that CHPPM and some of the other places are doing to see if we are looking at design acquisition use and disposal in the proper way.

Dr. Timothy Gerrity

As a result of the Presidential Advisory Committee on Gulf War Veterans' Illnesses, there was a recommendation that the President issue a Presidential Review Initiative to the National Science and Technology Council, to design a comprehensive strategy for health issues centering around future deployments, both relative to the service members and their families as well. In response to that, the member departments of the National Science and Technology Council undertook this charge. There were four workgroups, there was a workgroup on deployment health, a workgroup on records, a workgroup on research and a workgroup on risk communication. What I'd like to briefly describe to you is what was done by the workgroup on research. There were six major goals for research, several specific objectives, and in final detail, many more different strategies. Let me just give you the major goals first:

1. The US government will have the coordinated capabilities to apply epidemiological research to determine whether deployment related exposures are associated with post-deployment health outcomes.

2. The US government will have balanced research programs targeted at , a) improved prevention, intervention and treatment strategies for priority health risk factors and exposures, and b) improved biologically-based dose response models.

3. The US government will have the capability to systematically collect population-based demographic and health data to enable longitudinal evaluation of the health of all service personnel, active duty reservists and National Guard, throughout their military careers and after leaving military service.

4. The US government will have the capability to collect and assess data associated with anticipated exposures during deployment. By anticipated exposures, that is the result of a thorough analysis in advance of what might be encountered in a particular theater of operation.

5. The US government will have the capability to monitor deployments for the appearance of novel or unanticipated health risks, and to quickly deploy assets to collect and assess data relevant to any newly identified threats.

6. The sixth goal is not really a research goal. It is one that is charging the government with establishing a multitude of collaborations for the research effort–universities, other countries, etc.

Let me quickly go back to goal #2 because it is particularly relevant to our discussions today. One of the key words in there is priority, because we recognize that the Department of Defense and other agencies within the federal government are, as Jack pointed out, carrying out significant programs in certain areas. So what is necessary here is that we take a strategic view of that, we find those areas where we need more research and sustained research effort, and target those for paying attention. This research working group that developed this strategy took the following approach as we developed some criteria by which we would decide what the priority areas were so that anything that we miss implies that either it is not important or there's a determination that there is already sufficient resources being expended. Now one could always argue that there are never sufficient resources expended. Ask any university researcher. So here are the criteria that we looked at:

1. Based on best estimates, does the risk factor or exposure have the potential for causing widespread morbidity and mortality among deployed troops either during or after

deployment?

2. Is the degree of potential widespread harm high when balanced against the probability that the risk factor or threat would be present during deployment?

3. Do anticipated advancements from research and development efforts have a high probability of leading to significant reductions in morbidity or mortality?

4. Is current risk factor research within the military community currently insufficient?

So, these were the criteria that were applied when we looked at the panoply of areas of research that we thought needed to be emphasized in regards to dealing with future deployments, and these are what we came up with: traumatic combat injuries, psychological stresses, infectious disease, unintentional injuries, occupational health problems, that is, and collateral health effects caused by weapon systems. We developed various research objectives and strategies centered around those areas. Research priority number one was chemical, biological and radiological warfare agents, and one of the objectives was improved protection measures for service members. This was clearly an area that was identified out of the Persian Gulf experience. This includes: strategies developed to improve masks with minimal burden to wearer; develop improved protective clothing; examine new materials and technologies which allow greater flexibility and longer sustainment of activity before fatigue sets in; develop pharmacological countermeasures for long-term effects of chemical, biological and radiological weapons; improved chemical, biological and radiological detection devices, again another prevention devise, because again, our experience taught us that those devices were not adequate; define medically relevant detection requirements for these agents; develop wide area standoff technology to detect liquids, aerosols and vapors permitting a true mapping information capability; develop technologies to detect medically relevant levels of chemical and biological agents in water.

I'm not going to go and read through this. I really wanted to do this to show you a significant effort that the federal government engaged in, Health and Human Services and the Department of Defense, Department of Veterans' Affairs, in really looking at this problem. My purpose in doing that is to make the following recommendation and that is, not that this be also the framework for what comes out of here, but that it be included in consideration as we work through and develop over the long-term, the recommendations that come out of this workgroup.

Dr. Melissa McDiarmid, Chair

Happily I didn't hear anything that sounded really different and in fact, the priority setting used is the same one we have up there under public health. So that means we're all thinking the same way, or went to the same school. Would you do me a favor and take those five priority areas and put them up on that board behind Dr. Heller? That would be something to keep making us come

back to that to make sure we don't forget. I think we're having a little trouble with engineering. Why don't we go so we don't get bogged down, and it's ok to come back if we stumble on something that would be a good thing to put under there. Administrative is clearly the area that we exploded already in terms of what is ripe for opportunity, so why don't we spend some time there? We have a lot of different elements under just administrative controls. Let's start with health education Issues. Again, I want to remind everybody, we're not talking about what's good to do, we're talking about how can we recommend research issues. So we can turn what's good to do into a research issue by saying we either need to identify data gaps, we need to talk about ways to look at the outcome, the efficacy, the success of something you want to recommend.

Dr. Douglas Rokke

On education, I think we can divide it into two parts. One is going to be for the medical professionals, and the other for the average individual, the troops. I think there's two separate educations in there. Within education, again, it goes back to trying to identify what are the knowledge, skills and attitudes that the medical professionals or the individuals need and then once we get those knowledge, skills and attitudes, what we need to do is identify some instructional strategies to optimize or make sure they acquire those.

Dr. Melissa McDiarmid, Chair

Are there some specific areas?

Mr. James Tuite

Again, I'm going to have to raise the issue, this is where the problem is. We can come up with all the research strategies in the world, unless we have some quality management practices, and research into how that . . . because it's not the same as just pulling out a QMP book, because they've got a different environment. We're going to have to do research studies into how they can make sure that the strategies or the plans that they have now, and forget what comes three or five years down the road, can be implemented, how they can be enforced, or how they can make sure that at the command level, the general knows as much about, or at least respects the threats associated with these agents, as the troops that may be exposed to them, and that there is some chain of accountability for making decisions from the command. That's not occurring right now. It didn't occur during the Gulf War. We had a lot of research that indicated that there was a problem with combined exposure. And when it came time to actually implement it on the battle field, there was not training to actually take it from research to practice. It can't just be something we decide to do when we go into battle, it has to be part of the military environment.

Dr. Melissa McDiarmid, Chair

I agree. I'm just wondering if we're straying into risk communication. I'm going to ask Tim, who is our risk communication expert. Can you talk about the difference between health education and risk communication so that we organize this correctly?

Dr. Timothy Tinker

A very simple distinction, as far as health education is concerned, the focus there is in how we can effectively use and develop curriculums especially with those two audiences–medical professionals, health professionals and the broad range of that, whether they be physicians, nurses, physicians assistants and other allied health professionals. Risk communication, very simply defined, is the exchange of information between the sender of the information and the receiver of the information about the nature, the risk and the magnitude of exposures. Really, the optimum phrase in that definition is the exchange of information, as Dr. Max Lum was talking about. The central concept behind risk communication is not only the sending of information, but the receiving of that information in the form of feedback, and what are the vehicles, the mechanisms that we use to receive that feedback, whether it be at the interpersonal level, the use of print media, mass media, especially what has come out in our discussion, is the use of the Internet. So I think that's the very simple distinction. Risk communication can rely both on interpersonal and mass mediated approaches, for not only disseminating the information, but receiving the information back.

Dr. Melissa McDiarmid, Chair

So this area about recommending being clear about people in charge understanding the nature of the risk they're supervising, is that risk communication, is it in health education, is it a hybrid issue?

Dr. Timothy Tinker

To me it's more of an operational process type of issue. I'm not so sure it fits neatly into either of these two categories.

Mr. James Tuite

I think it fits under the whole heading. It fits under that administrative umbrella.

Dr. Melissa McDiarmid, Chair

So, Mr. Tuite, would you say one of the things that is lacking, that we need, is research into the barriers that prevented the dissemination of information or that it didn't make it onto the radar screen of people that were in charge in terms of decision making?

Mr. James Tuite

That can be one research proposal, but another one could be a management plan that would make sure the information got from one level throughout the entire structure, and that there was an enforcement mechanism in place so that people at all levels knew what they were supposed to be doing. For example, we would know what to deploy and when, we would know what the right pesticide set was for that deployment, we would know what the right preventive medicine set was. We do have preventive medicine. We would know what the right preventive medicine set was for that deployment, and we would have procedures in place to make sure that that occurred.

Dr. Melissa McDiarmid, Chair

How do I distill that down, because I have to say this tomorrow.

Mr. James Tuite

It's a quality management plan, very similar to the plans that are used by OSHA, and the FDA uses it to make sure that facilities manufacturing biologics actually follow the procedures.

Dr. Melissa McDiarmid, Chair

There's a content issue here and a responsibility to understand content and so that informs decision making. And one of the things we saw breaking down was that content information was not brought to the decision making when a strategic or field person overruled a medicine decision. It's not clear whether, it's okay to do that, as long as everybody understands what they're buying off or what they're going to lose. I think it was pretty clear, a lot of us know that that information wasn't there, and that some of these decisions were made in an uninformed manner. I don't know where to place that exactly. That's our problem.

Dr. Timothy Gerrity

I think what Jim is saying is very important. My concern is in terms of the charge this group, is that it's not research.

Dr. Melissa McDiarmid, Chair

I think barriers to that is research, and why that happened. I'm not sure that we know all the reasons.

Dr. Timothy Gerrity

Well, if you say that you would propose to do a project that says, here is a hypothesis that is stating the reason why information isn't communicated effectively and here's an approach to testing that hypothesis with the goal of establishing some kind of generalized knowledge, yes, I would agree that is research.

Mr. James Tuite

We're not arguing that it's science research. We're arguing that it's management research or practice, and that's necessary, because we can come up with all the scientific hypotheses we want . . .

Dr. Timothy Gerrity

I agree with you. I understand that.

Dr. Melissa McDiarmid, Chair

I'm going to trust that these guys can summarize this. We'll try to be fair with it and maybe we'll make a proposal tomorrow morning about what we did with it, and you all can have at it.

CAPT Michael Kilpatrick

Let me throw out a final thought on this. Maybe what we're all dancing around is metrics of education. Because I don't think that there's a paucity of education information, but the metrics or measuring success will then give you an idea or window into what are the barriers of people not getting it. People go through lots of schools but I'm not sure there's an examination other than being in the field, and are you successful right now, and then it's too late.

Dr. Melissa McDiarmid, Chair

I'm going to cut us off here because we need to move on. We'll do the best we can at representing what got said, and tomorrow morning you can all critique it. Is that better? Okay. So that was that one item. We're not finished with it. We're on health education, or I was on that. Are there any other issues that people at the table want to bring up? [No response from audience.] Tim, can I ask one more clarification? Health education issues for the soldier different from risk communication issues for the soldier, would you do that for me one more time?

Dr. Timothy Tinker

We had a sidebar here, and that's a nice distinction . . .

Dr. Douglas Rokke

Part of it is being able to recognize what's happening, and then the consequences or the severity thereof. The soldier needs to have that understanding so he can make a decision, but again, that's based on education.

Dr. Melissa McDiarmid, Chair

And that's health education?

Dr. Douglas Rokke

That's sort of the breach between health education and risk communication. So that's part of the health education, and the risk communication is, how do we get that information out, as has been asked here several times today.

Dr. Melissa McDiarmid, Chair

Is health education more content and risk communication is more process like how you want to hear it? So there is a role, there is a place for doing that with a soldier under both of those. Who are the other populations? Doug, you said medical professionals for health education. Maybe we can get the other populations down that need to have health education pieces or risk communication pieces represented.

LT COL Bob Thompson

From a Military context, there's really three populations, two have been identified already; the soldier and the health care providers. The third is the Commanders.

Dr. Melissa McDiarmid, Chair

Okay, that may solve my problem.

Dr. Timothy Gerrity

To underscore that, the commander is a risk assessor. The commander is making decisions about what is the appropriate way to approach a problem in the field, minimizing casualties to their own forces. So, the communication that has to go outward is that it isn't just bullets. There are other factors that can play a role in the decision making process.

LT COL Bob Thompson

We've actually, through the anthrax vaccination program, identified a fourth category that we're

starting to pay attention to, and that's the civilian populace, the family members, the parents of that soldier or healthcare provider, because when you look at the reserve component, they're out there in this vein of structure and they're going to primary care providers who are in the same sector. So we're starting to try to reach out and touch some of those people.

LT COL Philip Bolton

Could I just add something about the family? In the operations that were about to take place last February against Iraq, we deployed a force out there, and started immunizing the force against anthrax. Part of the work was to send information to the families about these immunizations and because of the alleged problems with the anthrax vaccine and all the other vaccines in the Gulf, take up was not what we would have liked, and that remains to be seen whether that was a personal threat assessment by the force or not. We have sent some focus groups out to gather opinions and the strongest opinions expressed about the anthrax immunization, was the offense taken by the soldiers or the sailors who deployed, of the paternalistic Ministry of Defence just going in and telling the families about this.

Maybe the mechanism of telling them was wrong or maybe the information was wrong, but they felt the Ministry of Defence was being far too paternalistic and going and telling the families. The soldiers were the people having the vaccines, they felt they were the folks at risk, and almost, what has it to do with the families? So, I put that in as a caution.

COL Ken Scott

Maybe I could add another anecdote as well. On our mission to Rwanda, we gave detailed lectures to our deploying personnel on the drug, Mefloquine, a then licensed product in our country, because there were concerns that the soldiers had, based on a previous deployment of Canadian personnel to Somalia. So, we ave lectures before we left, we gave lectures when we arrived in theater to small groups, after hours, in one on one sessions, when they were actually in the country where malaria was endemic. We thought we had done a good job in trying to educate those personnel, we answered any questions they had, we offered them alternatives. Approximately four months into the deployment, several Canadian personnel stopped using the drug in a malaria endemic area where the unit that we had replaced had ten cases a week. That was not good. Falciparum malaria could kill you. They stopped it because their wives had read about problems in the newspapers and in our instant age of daily or weekly telephone communication, their wives and their military colleagues back in Canada, told them, "You better get off that drug." So, maybe a research project looking at risk communication could address the issue of whether it is more appropriate to educate the deploying personnel, the deploying personnel and their family, or the deploying personnel, their family and the members of the unit left behind.

Dr. Melissa McDiarmid, Chair

Anybody else? I like the idea of these details. This is the level at which we'll be the most helpful to folks, so if you've got other specific ideas, specific venues, avenues, let's hear them.

Mr. Larry Edmonds

I just want to say one thing about the families. I think it's really important that the families, service personnel, their spouses, their children, are considered in this whole process of education, risk communication, and more importantly, we come down to surveillance issues, because all these parts have to be involved. The points I want to get across are kind of layered, but it's monitoring the whole family.

Dr. Melissa McDiarmid, Chair

For what?

Mr. Larry Edmonds

Well, I'm interested in reproductive health particularly.

Dr. Melissa McDiarmid, Chair

Well, we're back up on education, so I wanted to know how you want to do that.

Mr. Larry Edmonds

Reproductive health, you have to communicate too what the risks are. Parents are very concerned when their spouses are deployed, about their risk later on with reproductive health, so that really does need to be communicated, what the risks are, what the real risks are, because that is an issue that comes up a lot.

CAPT Michael Kilpatrick

I think maybe what we're talking about is that we need some research into what levels risk communication need to go on. Who are all the players? DoD had three, now we've expanded it to four, we're hearing from a CDC standpoint that maybe there are other populations, and I think that we really don't know. Risk communication is a wonderful tool, but which way does it need to go? We're thinking right now, talking anyway, top down. We travel to the active duty bases, and have people come up one on one and ask questions, the answers are right there in the facility, but they don't know, from a risk communication standpoint, how to go ask for information

without feeling they will be damaged, or earmarked or castigated in some way. So I think that's another part of risk communication research, that in the military setting, we need to understand, because medical care in the military setting is different than any place else. It's the last place you want to go, because you can lose your job and that's got nothing to do with Gulf War, that's a fact in the military. And that's a risk communication issue we have to learn how to get over.

Mr. James Tuite

I think that since we're looking at health education, sort of as risk communication at this point, we've identified four categories and I think there are certain proposals that say we want to look at levels, nature of, content and techniques of providing this education and developing good solid risk communication policies. In other words, you just can't decree what the risk communication program is going to be. I think that there are plenty of places that do very good research, some of which are within the government, in providing us with criteria that would be able to tell us, there's something, you can't tell medical professionals obviously, in much more detailed content then commanders. They need to understand what the medical professional tells them. We need to, I think, have some research proposals maybe aimed at all of those categories, and then we have some sort of an idea of what those lines of health education and risk communication should be.

COL Ken Scott

I'd just like to add one other factor, again. Not only the parties involved, I told you that we gave talks before we left, when we got there, how many, what time frame should you be using? If you're on a six month deployment where you are exposed to malaria, or whatever, should you be communicating the risk before you leave, as soon as you get there, and that's it, or, three months into the six month deployment, when compliance as we know traditionally starts to fall off. What is the optimum frequency of reinforcement of the risk communication that you gave at the very beginning?

Dr. Donna Dean

I'd like to ask a question for clarification. I'm making the presumption that when you're talking about this in the military arena, that you are presuming that it is to be built upon what people are finding in the civilian sector on things such as drugs of abuse risk communication, transmission of AIDS risk communication, health education and risk communication to many medically under-served populations. I assume you are saying that these kinds of efforts would build on the findings that are know there, or are they different?

Dr. Douglas Rokke

The procedures and the techniques, I think, are the same. The content is different.

Dr. Melissa McDiarmid, Chair

We're going to take comments from the floor. I promise you there will be time. There will probably be more time than we were going to allot, because we're doing pretty well here. I've been writing things down on health education and risk communication together, since there is an overlap, and I'm sort of doing it together. Are there other things that anybody at the table wants to bring up about either of those two areas? I think we have some very good specificities, but I'd be happy to hear more. Dr. Heller, do you have any comments?

Dr. Jack Heller

One of the groups we really need to hit and target our training to are the grunts in the field, as you call them, because I think they were a lot more informed about the risk. They make the right decision out there, but they also learn what the real risks are and what some of the real risks are not. I work with environmental exposures all the time, and sometimes I think we worry about, or overburden ourselves with not the biggest risks. That's something I'm really concerned about, and I think if they get, and there's always a problem with time in basic training, but I think that's when they need to get hit. They get a certain amount of training, and I know one of the things that's going to be added is some of the new DU training that's coming out. It's going to be on a number of levels, the basic level that everyone will get, what the tank crew will get, what the medical professional will get. I think it's something that's really important, just to be able to get the message across to the basic troops about the severity of risk so they're really concerned about what they really need to guard themselves about, and try to relieve some of the anxiety.

Some of the things I've heard are, and it still boggles my mind, "I signed up to take a bullet, I didn't sign up to get cancer in thirty years." I still don't understand that, and so, I think if they understood more about some of the exposures they got, the real risks, maybe they'd be a little less concerned about them, and be concerned about the ones that I think are a problem. The things that are important in a deployment are, like Tim Gerrity said, you've got to focus on the things and do the research on the things that are really going to hurt our troops and that we have a chance of success of protecting them on, whether it's a new chemical suit, or a new chemical mask, or better monitoring for high level things and really hit that. So I think if they got more education about the things to really be concerned about, and some things they can be less concerned about, I don't think they get that now. I think it would be really important.

Dr. Timothy Tinker

A couple of very quick points that the panel may want to consider that I've been hearing and it's been a reoccurring theme over the last day and a half, is the high level of scientific uncertainty that surrounds the whole issue, and how can we most effectively communicate that uncertainty. The other point, we've been spending a lot of time talking about receiving information. Well, once

we've answered that question if people are receiving the information, how do we know that they understand the information, and are they acting upon the information, are they actually using the information? So the value and the utility of the information, those are two other research points.

Dr. Melissa McDiarmid, Chair

I was going to ask you, Tim, in addition to whatever you want to say, would you also, before we leave these topics, go through that list and see if there's anything that we could easily use?

Dr. Timothy Gerrity

One of the things that I've given a lot of thought to, is that humans and other living creatures, depending upon the development of their brain, have evolved, I will pose this as a hypothesis, have evolved sort of a hard wire risk assessment computer, based upon input from the various senses. That is, things that say, get out of here, it's dangerous. Smell being an extremely important one. And it doesn't get processed cognitively, it gets processed through other mechanisms. What has happened as we have moved into a world in which the types of things that we can expose ourselves to, we didn't evolve to detect ourselves, or to develop a natural fear of, should we detect it, and I'd like to suggest that, when we think about the research that we might want to do, there is this evolutionary biological aspect that might be informative as we look at that, and that is, how do we take data input into a soldier's brain, if you will, in which they're now going to have to cognitively process that, in order to determine what their behavior should be now, when faced with this risk, as opposed to before in the past, being able to fairly reliably rely on visceral input.

Dr. Douglas Rokke

Some of what you just talked about goes back into educational techniques. When we look at science education or medical education, we're looking at awareness and knowledge acquisition, does the individual has the ability to perform a skill, but more importantly, and again, this goes under educational strategies, does the individual have the knowledge and the skills and the ability to transfer that under new sets of conditions as we see on the battle field, what we commonly called the fog of war. And more important beyond that, are they able to take those knowledge, skills, attitudes, everything they have, and synthesize so that they can develop new techniques and procedures or become aware of new things that they might encounter. It's an instructional strategy and a learning hierarchy that if you identify the knowledge and the skills, and then select appropriate techniques, it will work.

Dr. Jack Heller

I just have one comment, relative to what COL Scott said. You teach troops, I know there's a lot

of scientific uncertainty, the best state of knowledge there is, and then, with our mass communication and wanting to get it out first, so much stuff comes out in the media, and then, oops, sorry it should not have come out, it's not true. They may fully have gotten their training and understanding and belief, but somehow we have to address that. A lot of it is trust and credibility that we don't have now, is that they trust what we tell them, and we're going to tell them the truth, because they get bombarded with 100 other things that may give another opinion of something that we just told them about, and I just think until they trust what their leaders are saying, we're going to have a hard road to go.

Dr. Henry Anderson

I was just thinking that as a research area, I think perhaps unique in the military is the comparative risk issues. When you're in the field, the number one threat is being killed by a bullet or bomb or whatever, and that really is so overwhelming that your cognitive processing of comparative risk is potentially problematic. I would think that we really have to, as part of the training, also look at consequence analysis and comparative risk for the individual when they're thinking about medication or vaccines and things like that. I think part of the risk education really needs to have that comparative part built into it. We have to better understand the soldier's personal threat analysis at various points they go through and be sure that their response is appropriate. I think in our decision making, we have to have a feedback mechanism as to whether that's appropriate or not. For example, thinking "I haven't got malaria so far, and I'm worried about this and that, and I'm not going to be vulnerable," you need to reinforce that and I think you've been working on those kind of things. Individuals with special risk are also of concern. How we get that into our education is a research component, that is, can we use the same methodology as we use for the general public, or is the military circumstance different? We know different occupational settings, we approach men and women differently, is this a issue that we need to look at? Are there unique circumstances and characteristics in the military?

Dr. Douglas Rokke

I think it deals more with how do I communicate knowledge so we're looking at what type of vocabulary and what type of analogies do I use so that the individual develops all of those levels I just mentioned.

Dr. Melissa McDiarmid, Chair

One of the other problems is the invincible 19-year-old. I think that's an additional barrier, because all the usual things people are saying, it's not going to happen to me and all that, but this is even worse. It's the super, super healthy worker.

Dr. Jack Heller

One thing we've got to think about and focus on in our research is that the Gulf War anniversary was eight years ago. Since then, we haven't had another war, but we've deployed to Rwanda, Somalia, Haiti, so a lot of what we have to do is, it's not going to be a wartime deployment, it's going to be humanitarian deployment.

LT COL Bob Thompson

Just a couple of follow on comments. When we talk about trust and credibility and communication, the greatest trust and credibility occurs at the unit level, at the company, at the platoon. So when we look at how we're going to deliver the message, it has to come through that company commander and through that platoon leader.

Dr. Timothy Gerrity

Going back to something that Henry said, Henry used the word "feedback" and that goes back to lessons learned from the Gulf War, and that is that when an incident happens that could put the soldier or the unit at risk for something having occurred, that the value of then getting and closing the loop on, not what did happen and what is the risk of what happened, because what that then does is, that closes the loop it provides validation of the level of response that they have themselves personally applied to that and then should help to modify the future response.

LT COL Bob Thompson

We on the Joint Staff have already approached that issue and addressed it through some doctrine that we put out, because what Tim said is very important. Before service members leave a theater, we want to make sure they have an opportunity to have issues or concerns addressed to include any potential exposures they may have had. So now, before they leave a theater of operation, they do a health assessment. There are a number of questions, it's very brief, very streamlined. One of the things that we ask them is, "Do you have any concerns about potential exposures that you felt you've been exposed to?" And if they answer affirmatively to any of the questions we ask, a healthcare provider steps in and addresses those issues right on the spot before they leave the theater. Now he or she may not have all the answers, but then there would be follow-up to get the answer back to the individual.

The other thing that I'd like to mention is that when we talk about risk communication, what we're really talking about, at least from the Joint Staff's perspective, is risk management. Those decisions are not really made by soldiers, but by the commanders. So we have to look at how we're going to make it easier for that commander to make those very difficult decisions on the battle field when we're talking about not acute, but chronic decisions, risk management decisions. We have to look at how we can make it very streamlined and what is an acceptable risk when we're talking about chronic effects.

Dr. Melissa McDiarmid, Chair

I think we have to move on, but before we do, Tim, would you look at that list and make sure we haven't missed any obvious winner?

Dr. Timothy Gerrity

This list that was developed is, if you will, is a risk factor list, an exposure list, that is of concern, and then when we think in terms now of prevention, then we can take each of those and ask the question, "What preventive measures can lower the risk with those exposures?" For example, as I had actually read from the PRD5 before, relative to chemical, biological and radiological warfare agents was, research to improve protection, that is, improve suits and masks, etc., designed appropriate to the type of exposure that would be encountered or anticipated, training of the soldiers on how to effectively use the equipment that they have been provided, improve detection capabilities, the nature and type of detection devices would again be appropriate to the risk that one is dealing with, and that the hazard levels associated with warning that says, 'Here is a hazard', is biologically based and so then has meaning that would be translatable for the soldier.

Dr. Melissa McDiarmid, Chair

Limit yourself to just health education and risk communication because we'll put what you just mentioned under "Environmental Surveillance," okay?

Dr. Timothy Gerrity

Okay. Stressors - what can we do with soldiers in advance of deployment, both during their general training as well as specifically before deployment? It has been called by some psychologists literally as psychological vaccination against stress. In other words, what kind of education, what kind of communication can we be engaged in that can prepare the soldier before the experience that he or she will go through during a deployment? So this is related to education.

Emerging health concerns - what that really translates into is dealing with exposures for which there is insufficient data to really accurately assess what the risks are. This again goes to the uncertainty of risk and the communication of that uncertainty. That is, you may be exposed to something for which we don't have a good handle on what the risks associated with it are. This is something that could be experienced again, this is a result of participation of deployment, combat, etc.

Infectious disease - what can one do themselves personally, education, to decrease the risk of infectious disease? Ken Scott raised the Mefloquine point, and that is being able to explain well

what the risks are of taking a drug. One has to understand there is no such thing as a drug without side effects and if you're taking a drug that doesn't have side effects, it probably means the drug is not effective at doing what you want it to do in the first place. So again, education about those protective measures that could decrease the risk of infectious disease of a variety of kinds, depending upon what the infectious disease that you're targeting is. Also, relative to the education is, what are the health risks possibly associated with the vaccinations themselves?

Occupational risk factors and non-combat injuries - this, I think my colleagues in the military would agree, is a continuing on-going problem during deployments, and that is the kinds of accidents that would occur in any heavily industrial environment. There were a significant number of those kinds of injuries that occurred during the Gulf War. Many of them attributed to lack of sleep. Soldiers work under extremely stressful environments as they're being asked to do things while undergoing environmental stressors such as lack of sleep, being inadequately nourished, etc. that can, in an environment outside of combat, could put them at risk. Again, what can we do to educate our troops about those things that they can do, and in this case I think it would apply very much to commanders, in terms of scheduling work, etc., to take into account an individual effectively carrying out their job safely, relative to all of these physiological factors.

Dr. Melissa McDiarmid, Chair

Thanks, I appreciate that. We spent a lot of time on this. On the other hand, I think one of the reasons we did, is because this is one of the areas where we can actually do something. I'm going to take comments from the group at the end, I promise. One of the reasons I'm speeding up is to make sure you all have the time I promised. I think we saw there was a lot, we had a lot of potential to get some things on both of these topics. We do need to go a little more quickly. Surveillance - a topic near and dear to many of our hearts. Let's start with environmental surveillance. So here I'm talking about ambient environment and some of the recommendations that you all have mentioned about better realtime instruments, and such.

Dr. Douglas Rokke

I think I want to break it down just the way Tim's got it up there. The CBR or the NBC, whatever term you want to use. If we look at the nuclear or the radiation, I think we've got the low level radioactive materials in there and we've got the actual nuclear end. So those are the two separations trying to do the research to identify and develop equipment that again, is usable in the field by the individuals who are going to use it, without a whole lot of complexity. One of the problems that we had, and Jack and I talked about the complexity of the equipment that we had run into for special monitoring, was a nightmare, and that's why we designed the new equipment. Then, the biological. Again, trying to design equipment and again, some of this has already been done, so we might find it's already done when we put this in there. We'll look at viral, bacterial, fungal, that whole series, and we'll just separate those things out.

Dr. Melissa McDiarmid, Chair

Tell me, how are we going to assess the environment?

Dr. Douglas Rokke

We're looking at the environment and trying to find out what are the threats in the environment. So we're trying to identify some types of equipment that are going to be able to do rapid detection of either an NBC or CBR threat in the environment that can affect the soldier or the operation. So again, this is just on the environmental portion part of it.

Dr. Melissa McDiarmid, Chair

So you're still on the equipment then?

Dr. Douglas Rokke

Definitely. On the environmental, on the equipment. So again, trying to identify for the biological equipment that's going to give us the capability in those various areas. Then, again on equipment still, under the chemical end, looking at what we can normally call all the chemical warfare agents, the nerve, the blood, the blister, the choking, the hallucinatory type drugs, because that's being used, and then along with that, all the toxics. But, I didn't have the equipment necessary to do surveillance, so all we could do was just strictly knowledge and skill-based clean up. So again, Jack, I know you did some of that work and looked at some of the contaminants and measures and that, but there again, is some type of equipment. So this is strictly equipment in those areas to help us categorize what the environment or what the threat is.

CAPT Michael Kilpatrick

I think we heard earlier today that we're looking at surveying the environment. We have to figure out where those thresholds are that are important to humans. I think we don't have the research though. If we develop equipment so sensitive that it picks up a molecule, and it has no human significance, then we've got a big risk communication problem. So I think we need research in the area of what are the levels that are going to be of medical concern? I don't mean making people sick, but concern for long-term event.

Mr. James Tuite

For a research recommendation, we need to identify what is a safe baseline environment and what are some of the health threat indicators, using equipment in inventory and the threat in production assessments.

Dr. Melissa McDiarmid, Chair

Would the issue we brought up earlier about exposure limits not being set to eight hours or forty hours go here? And the issue of basically living where you're working and one of the other examples that I'm familiar with in the occupational health setting, is wildland firefighters. We had to think about this, because these guys basically lived sort of a little bit farther removed from the edge of where they were working, so issues about exposure limits and eight hours or forty hours didn't apply, because they were there for weeks at a time. So that might be something that we might look to as an example.

Dr. Douglas Rokke

Those exposure limits come under the current physical conditioning of the individual. One of the problems we run into again, in the environmental end is, I might say, for example, in air pollution, I'm taking in twenty cubic meters a day. Well, if I have a stressor that changes it up to thirty or forty cubic meters a day, now I have to reduce the concentration of exposures that I have so I don't go over the limit. Now again, this is exactly what Mike was saying, trying to identify what is the actual threshold of problems.

Dr. Timothy Gerrity

Yes, I think that's really important. Just like the talk of and work of Hermona Soreq, where nobody looked at pyridostigmine bromide and stress in combination. So we really do have to look at the actual operational environment and how that can modify the response to any agent in the field. Another difficulty, and I'm not sure if this is research or risk communication, we have to be very cautious about, when one looks at environment and occupational health standards, for chemicals, that those are also very large uncertainty factors, margins of safety, etc. that are built in, and some of that has to be appreciated, both in terms of understanding about the risk as well as the uncertainty of those risks.

Mr. James Tuite

I see these baselines as something we're going to be developing over a long time. This is not something that we're just going to have someone award research on.

Dr. Timothy Gerrity

I'm not sure these numbers are totally entirely accurate, but they're probably pretty close. I think Melissa you may know a better number. I think it's somewhere around 10,000 chemicals or man-made substances manufactured in the United States, and in about 10% of those there are health data. By health data, I mean toxicological data, not necessarily data in humans, but some data in

animals. Then of that 10%, there's probably another 10% for which the data is adequate to actually do an accurate risk assessment and this is a function of the tremendous number of chemicals that are manufactured, that people can be exposed to, and the almost overwhelming task of really tackling that. I mean, if you really wanted to solve all 10,000, it would take the entire budget of the US Government to do it.

Dr. Melissa McDiarmid, Chair

It's 70,000.

Dr. Jack Heller

That's why, what Tim mentioned, with all the chemicals one of the things our research has to do is focus on the most prevalent ones. And so, there are a number of studies, the ITF study worldwide, that looks at what are the most prevalent, looking at toxicity and amount produced, and a whole host of things, so, I think we can use that to key in. The other thing is, we do, in the military, we do threat assessments all the time, and we have a lot of data, some of it classified, on what's around the world, because we do a threat assessment before we ever deploy. So, a key thing is, some of the information we have, and to focus that, where are we liable to deploy more often? I think if we know where the trouble spots are, there may be certain chemicals in an area like that. You need to have the military involved to focus it, so it's as beneficial as it can be for us.

One other question about what Dr. Kilpatrick said, agreeing with, we need to find out what the medically relevant level is and be able to monitor for that as quickly as we can. As soon as we have a safe level for one thing, there's four other things out there that are also at the safe level. It's the whole synergism thing. Everything individually is safe by itself, but we have to be able to look at not only, and it's really important and will help the commander, what are the safe levels so it helps him make his judgement? But what happens when we get synergism, and we have this combination also with troops, there's occupation and occupational exposures. You're a soldier, so you get 24 hours of exposure to what's in the environment. But in addition to that, you have a military occupational specialty, so you may be getting your occupational, whether it's a fuel handler, exposure in addition to that, so there's a whole host of different things when you're in the military.

CAPT Michael Kilpatrick

I just want to make a side bar comment. In the Gulf War, we kept the biological vaccine secret, because we didn't want the enemy to know what we were protected against. Obviously, we've got a mind change, in that we now are announcing we're vaccinating our troops against anthrax. Perhaps on what the threats are out there, we need to look at that with a new mind set. If our

troops know what the threat is, and their families know, then we're maybe ahead of the game than behind it.

Dr. Melissa McDiarmid, Chair

I just want to give a chance for the colleagues down here that aren't saying very much to weigh in here, if you'd like. Dr. Bolton?

LT COL Philip Bolton

I want to echo what was said. I don't have any burning points right now.

Dr. Melissa McDiarmid, Chair

One more comment on this and then we're going to medical surveillance.

Dr. Henry Anderson

I just have one comment on the environmental monitoring. I think we also have to look at the efficiency of the equipment that we're taking into the field to operate under extreme temperature conditions and things like that, and the accuracy of measurement. The other, as we get into medical surveillance, is that we have to look at the toxicity of various agents in somebody who is dehydrated or other conditions like that, especially when you're in those environments, keeping people well hydrated is problematic. They don't recognize that they're dehydrated.

LT COL Bob Thompson

I just ask for an opportunity to say one last thing before we move on to the next subject and that is, more or less, to just summarize what I think I heard my colleagues say up here. First, what we need to do, because we've heard so much this week about low-level exposures and the importance of definitions, is to have an effort that actually defines, what are low-level exposures and what are the risks with it that are acceptable? Two would be to try to prioritize contaminants that are out there, potential contaminants, and then three would be for each of those contaminants, begin to establish the threshold values.

Mr. Larry Edmonds

Can I say something about the environmental part? I don't know how we're going to do this, linking environmental surveillance with biomonitoring too. Looking at biomarkers for exposure to these various agents. I mean, they shouldn't be separated. Maybe we ought to come to that first, and then the medical surveillance, I don't know.

Dr. Melissa McDiarmid, Chair

Okay, so linking your environmental exposure to outcomes that you would determine in medical surveillance . . .

Mr. Larry Edmonds

Well, no. Biomarkers of exposures. If these people are being exposed to this, what are the biomarkers? Are they getting any?

Dr. Melissa McDiarmid, Chair

Right. That's biomonitoring.

Mr. Larry Edmonds

I would take the environmental part, the biomonitoring, then the medical surveillance.

Dr. Melissa McDiarmid, Chair

Well in occupational medicine, biomonitoring is an aspect of surveillance. But that's fine.

Dr. Timothy Gerrity

In conjunction with that, it might be important to also distinguish between monitoring for the purpose of warning, and monitoring for the purpose of surveillance, because those would actually be two different technologies.

Dr. Melissa McDiarmid, Chair

I'm going to divide medical surveillance and biomonitoring into two different areas, because I think it's easier to organize the recommendations. Okay? Do you want to first talk about what is near and dear to your heart?

Mr. Larry Edmonds

My area, as you know, is reproductive health and these issues don't come up until after. I think our group has dealt with it a lot in Gulf War and Vietnam. A lot of men come back and they want to know the future. What's going to happen to their families and their children? So, I feel very strongly that the DoD needs to consider good medical surveillance systems in military treatment facilities and civilian hospitals because with the Gulf War experience, half the babies delivered,

delivered in civilian hospitals not military hospitals, so you need a comprehensive surveillance program. This kind of surveillance is not just for children, it can also look at cancer, it can look at all kinds of outcomes if you design a very efficient surveillance system for monitoring people over time.

Dr. Melissa McDiarmid, Chair

Can you say how we would do that?

Mr. Larry Edmonds

Well, DoD, I think, should set up a system-wide surveillance system for reproductive health, and in fact, they're funding some pilot studies through the Naval Health Research Center in San Diego, and I think it's very doable and the pilot's going to continue to be funded for awhile. So this recommendation has come out a number of times over the last few years, and the DoD is starting to explore putting it into place, but I mean a long-term commitment for doing this, because there's going to be another deployment, another exercise where troops will be exposed and the questions will come up again. If you have this prospective data, it's much easier to look at that and try to evaluate concerns that are common, rather than go back like we've had to do with Vietnam vets, or Gulf War vets, trying to do these studies.

Another component of this surveillance is not only the military personnel. They leave the military rather quickly, these young soldiers. And the questions they raise about their reproductive histories, it's tough to follow them now. We have systems in this country now that are developing to do reproductive surveillance, and in fact, we've worked with the Navy on trying to look at a lot of these issues, hooking up military records to civilian surveillance systems. It's worked fairly efficiently, but it's really important to have good medical records that are accessible. The biggest problem is to try to go back to St. Louis and find these medical records on these soldiers. It's impossible. So, trying to think prospectively how we really set up a good surveillance system for people in the Military and after they leave, because there's questions coming in now from veterans from the Gulf War, obviously, so how do we address that and link these systems down the road? And that's I think, developing good medical histories, reproductive histories on soldiers and their wives, because the question is going to come up about their spouses, since the vast majority of people exposed to Gulf were males and not females.

CAPT Michael Kilpatrick

I'll just jump in here because I think we look at research and how do we do that medical surveillance, and I think you're talking about a real ideal to be able to follow people from when they sign up until they die and say what was the consequence on their health from military service, and their family members. I'm not sure America's ready for that yet. It would almost have to be

a single medical reporting system. Perhaps we could look at Great Britain or Canada as to how you would look at that because if you were able to be successful with reproductive health, then you've got diabetes, you've got heart disease, you've got cancers, so again, we have a National Cancer Registry, but as I talk to people, there are barriers in that. So I think this is a subject where there is fertile field for some real research in how do you effectively understand what we have in medical systems, because they are very different, and then the patient compliance, which is the bottom line.

LT COL Philip Bolton

I think quite clearly, as I said yesterday, we are able to trace the military population through our Health Service, therefore, whatever instrument you choose to monitor disease, be it the questionnaire, we can trace them with a degree of accuracy, subject to ethical clearances and data protection. We could call them in for medicals. If this whole Gulf thing had been ten years in latency, we would have a chance of getting them. I would suggest you should look at ways of tracing people and also the instruments you're going to use. The disease registries, I said yesterday, are there for the major diseases, in the UK they're a national asset. I don't know here whether they're a national or state asset, but again, if within a state disease surveillance system, you can identify those on the register who've had military service, you get a snapshot of how important a factor is in the military. But, as I say, in terms of research, I suggest possibly you need to look at how you're going to trace a military veteran once they've separated from service, through life, and the instruments you're going to use to assess health. I mean, in Gulf health assessments, we've spent enormous efforts in trying to trace people and improve their address data and just improve responses to questionnaires. The study reported in the *Lancet* had response rate of 65% against, I think someone else said 18% for postal surveys among the military. I mean our experience is, among the serving military, you get about 50% response rate.

COL Ken Scott

Since you've mentioned Britain and Canada, as part of the Goss Gilroy study that was mentioned yesterday, the mailout survey, we now have that data group and the control group. We have universal health care, it's free in our country, we have central registries for things like cancer and mortality and so at periodic intervals, we can take those two groups that we studied, access the cancer database, and we can tell at any point in the future, which of our Gulf War veterans have the cancers and which are the control groups. We can do that very easily in our country. We, previously over the years, tried to form collaborative research groups with the three countries, focusing on our strengths, and this would be a strength we have. You guys can't do that, it's easy for us to do, easy for the British to do, so we can do those sorts of things.

I just want to mention a brief thing about medical and risk assessment. One thing we started to do with our personnel, which is not validated, so research can't involve validation, is sending

information packets home with our personnel of their exposures while they were on missions. For example, Rwanda, all kinds of details about malaria, don't trust a doctor if you come back in the next year and you have a fever and he says it can't be malaria because it's nine months down the line, don't become pregnant after you've been on Mefloquine for about a month. I'm wondering, validating sending home some of these packages with exposures outlining what we know late in this century about PCBs and bauxite, if you're Princess Patricia or any entry person who thinks that you were exposed to that in Croatia, sending that home, we also explain in that package, to significant others, when the people come back from deployments, they're never the same. We've certainly seen that. They are not the same. That is normal. What we try and do is outline to the significant others that they should revert closely back to what they were before, given a period of weeks and if they don't, then we have contact numbers in there. We have not validated this. We do this because we think it's good, maybe it isn't. We have every intent, since we know from our multiple missions, that people are coming back from Rwanda, Bosnia, Haiti, Somalia with problems. It's not necessarily often when they get back, but it occurs in the two to three months following their deployments. Most of the illnesses you discussed can be accessed using questionnaires. Chronic fatigue, fibromyalgia, PTSD, do a validation study on these type questionnaires. People fill out these things and, we're not doing this now, it's something we intend to do, we have research money to start doing this. People fill out these questionnaires and it says, you filled out all these things, you have PTSD, via this questionnaire. You should go see somebody.

And finally, on the medical monitoring, healthcare providers are at greater risk than any other profession, we feel, on many of these missions. We bring all our healthcare providers together for a retreat, usually about two months after a mission. Everybody who was there, comes back. Now, they're back in the work environment at that point in time, and they're seeing patients, this is another way of monitoring. They would have seen some of their colleagues as healthcare providers, and as healthcare providers themselves, they get to meet in an environment and discuss their own concerns about the mission they'd been on, about their exposure to oil well smoke, if they happened to have been in the Gulf War. We didn't do that in the Gulf War, we've been doing that in the past two years, but we had not validated for that, as to whether or not, it's been of any use.

Dr. Melissa McDiarmid, Chair

Well I think we've got some very good concrete suggestions.

Mr. James Tuite

We have to have some sort of uniformity in how we're going to collect data.

Mr. Larry Edmonds

That population should be under the CHAMPUS system that deliver in those civilian hospitals and that's what I think DoD's exploring in the Naval Health Research Center studies, is how you integrate that. This is something that you really have to look at long-term. How you're going to set up a really efficient system. Tri-Care has come to play in the last two or three years and that's changed a lot of things. Medical record keeping, which is, I guess, next, I'm getting ahead here, but, my medical records and who has them? I'm in the US Public Health Service. I have my medical records. So, there's got to be some standardized way that we can really look and follow people if you really want to get good surveillance. I think the reproductive part is fairly easy, because you're talking about outcomes that are going to appear very quickly after somebody's in the service or leaves the service in a few years, so, that's fairly easy to track.

A lot of other surveillance systems in the country like, North Carolina you were talking about, you could link to that system, you could go to state systems. We in fact, did that with a lot of the military records of people that served. I think there are about six state surveillance systems where we linked to the total civilian population and really could look at the outcomes of everybody that served. We can't do that in every state, but on the civilian side, we're pushing to try and make those systems better. On the military side, we've got to collect the data to be able to link it and look at it. I think it's very feasible if DoD would just make the commitment to follow through on these pilot studies and implement it. It's going to take some changes, probably in record keeping and storage.

Dr. Melissa McDiarmid, Chair

Okay, Tim? We need to keep moving and I already said Tim can go, but we have to move on after that. There will be a chance to get other burning issues in after.

Dr. Timothy Gerrity

I just raise the question, is this an opportunity to, and an appropriate way, to convey the deficiencies that exist nationally, in our various health tracking systems or lack thereof, not lack of uniform records keeping, but is it a big inhibitory factor in accomplishing what we want to accomplish, and that is, the ability to survey health from enlistment to death? Because, as you said Mike, given the current system, it's a fantasy.

Dr. Melissa McDiarmid, Chair

The issue again, is we're trying to make research recommendations. This is a barrier. We can't even sit at the table with our colleagues, because we don't have national reporting systems. I'm going to push us on, because I promised folks in the audience they could have their twenty minutes, and they're going to have it. Let's do work practices, because a lot of things have been mentioned. That should go quickly because we have identified things already. Who wants to

jump in?

Mr. James Tuite

The only thing in terms of work practices I think is we need to have some sort of an auditing system of procedures and good management control. This is part of military duty. This is not an actual responsibility, but it's like cleaning your gun, physical activity, this is part of military service.

Dr. Melissa McDiarmid, Chair

With an evaluation piece or an outcome piece for that, right? That's how we can make it a research plan.

Dr. Douglas Rokke

I think work practices, this is an area where we can make a lot of impact. If an individual has the knowledge and skills that are necessary and understands what the risks are, and he can make those decisions, then he can select appropriate procedures. So I think, probably in the research agenda, what we need to do is set up some type of research program that's going to identify, what are those primary work practices that put individuals at risk. And then, once we can identify what those practices are, come up with a research agenda that can identify or determine what procedures can be changed. It doesn't mean we can change them, but what procedures can we change? Again, this is in line with everything we do with OSHA.

Dr. Melissa McDiarmid, Chair

I hear you. Are there some specific types of practices or some specific MOS's or machines or tools or whatever, that you all want to mention?

CAPT Michael Kilpatrick

I think one of the things that we have to take a look at, and this is more of an organizational thing, is taking a look at the work practice training of people coming together, particularly from the reserves or the Guard, because those individuals are not working day to day in the profession they get assigned to, particularly in the military. It's not always perfect match in the military either, but when we think someone is selling, for example, insurance, and that person now is a radiology technician, and has not been appropriately trained, then our system is broken. It's not the individual's fault that they haven't been properly trained, I think that work practice that we have to do the research on, is looking at what is the current practice, and as Doug said, where do we have failure, and do the research to say how do we make these systems work.

LT COL Philip Bolton

Again, you mention reserve organizations. The way we employ them, induct them into active service and the various parameters that affect that. Again, when we deployed to the Gulf, I think we broke all the rules that we teach about the prevention of psychological problems amongst the military in the way we deployed our reservists and our soldiers. We sent uniformed units out, which is fine, that's what we would do, but in the medical services and the logistics services, we had penny packets of people coming in from all sorts of different backgrounds at all sorts of different times, and there is the recipe for psychological breakdowns. I suspect that is an area that would could come under work practices.

Dr. Melissa McDiarmid, Chair

That's sort of work organization, probably. That's good. Anybody else over here with specific examples? Okay, should we go to PPE? We identified two this morning, one is chemical protective clothing; it shouldn't have to be three zippers, three pieces, right?

Dr. Douglas Rokke

I think the research for the PPE is not just design and ease of use, but again, the durability and how long, I don't know how you want to put this, how long is it viable?

Mr. James Tuite

The other issue is, the equipment be acquired and be made available that suits the nature of the threat. For example, we're talking about some threats that don't require MOPP gear or gas masks, and yet you can't use a gas mask and interchange with the respirators, and sometimes the respirators are much lighter, much less cumbersome and might be the appropriate piece of equipment. So, I think we need to do research into what equipment would be appropriate, given the nature of the environment we're talking about.

Dr. Douglas Rokke

I can give you a perfect example, and again, this is near and dear to my heart; it's the DU. For depleted uranium all we need is basically a coverall and a respirator. We don't need the MOPP suit or the protective clothing. However, when we did the research and put everything together because the individual soldier, as myself, when we went to the field, what you got is what you carry. So when we got there, we were carrying basically three BDU's, two or three pair of socks, some underwear, you know, not a whole lot, because it's a four time change. But the soldiers said if we have to put all this additional equipment or PPE in, we have to realize, how does this interplay with what we have? A conscious decision on the DU to reason why it was the MOPP

suit in the directives that I wrote was in the fact that that's what he's carrying. He does not have the capability of carrying a C-suit, you know, just tevlar coveralls. He can't do it. He doesn't have room. So again, it's the threat, where are they working, how long are they going to be in that area, could we put specific sets together that go along with the equipment for a specific function? So, if they get this job or mission, the set comes with them, they get it done, they turn it in, and off they run. So again, research into PPE design, PPE durability, and then research into determination of what is the appropriate type of PPE, and then how do we distribute that?

Dr. Jack Heller

As a civilian, when we deploy and do something and we want PPE for a civilian kind of problem, we use OSHA and NIOSH. I mean, I'm not sure how much research has to be done, but maybe setting up some sets to work with different things, because you're right. You don't use an M-17 mask for chlorine exposure. At least in the civilian component of the Department of Defense, when you do tasks or things whether it's, when I went to do the oil well fires, I threw all kinds of things in the foot locker, I didn't know what I was going to need. I had that luxury. The kind of stuff I used, whether it's protective gloves or coveralls, commensurate with the threat, you just take the kind of civilian stuff that's been tested for that kind of operation.

Dr. Melissa McDiarmid, Chair

I was going to say something related to that, which was, again we have to think about how to make this a research issue, but if the military is going to continue to go down a road by themselves, where they know better than OSHA or NIOSH about their own respiratory protection, then they have to produce the data to show it's as protective as what OSHA or NIOSH would require, so I would like some kind of research or show us the data that they're able to be on their own, but I think better than that would be to do what the rest of the world does, and to go through the same hoops that we do, you, as a civilian or I, as a civilian occupational physician. We go through those rules, so I think that's an issue that would bring them in compliance with the rest of the regulated community that has to use respirators.

CAPT Michael Kilpatrick

One area that I'd like to bring in here on PPE and also on some of the environmental surveillance equipment, is we really need research on what are the limitations of that? And I think we've heard from people, how long is the equipment good for, what is the level or thresholds of protection, what are the false positives on any kind of detector equipment? And I think the same would be true on any kind of personal protective equipment, is what are it's limitations, and I think that goes into, how do we prove that it's effective? Particularly, as we're looking at different time utilizations, given appropriate weather, somebody may be in a respirator for three days. I don't think you do that in a factory setting.

Dr. Timothy Gerrity

I think that one caveat that should be made in this is that when you're in an industrial environment, you've got a lot more control over the entire environment relative to the use of the protective equipment and the protective equipment could be designed to be effectively used for the job being done, etc., etc., all these ergonomic factors taken into account. The problem that the military has, and I'm sorry to speak for the military because I'm a civilian, but as I see it from my perspective is, that those operational environments are going to be extraordinarily variable and the challenge is to create protective equipment that is both protective and ergonomically flexible.

Mr. James Tuite

That should probably be the crux of the research. What kind of tradeoff should we make in order to get where we want to go?

Dr. Douglas Rokke

I think there's one overriding thing again, we have to look at, and it fits over all this stuff. How do we determine what the threshold is for exposure, which is going to guide the equipment, it's going to guide the PPE, and, what is the threshold for a combat or a wartime environment in comparison to the threshold for what we see in the standard community or the civilian environment, and then, where do the two divert? Because again, in the education, everything comes down to, if we have a vastly different threshold limit in the war time environment than what we had in the civilian environment, mom and pop and dad are going to go, nah, ah. So, I think we need to determine what is an effective threshold of what we need to look at. That's going to determine what happens for all of these things.

LT COL Philip Bolton

That's not entirely true. It is just another risk of being in the military. If you join the military, the ultimate payoff is that you get sent to war. Now, the risks of getting shot and shelled are much higher in a war than on the back streets. The chemical threats, the toxic threats, are implicit in it. At the end of the day, we still have a mission to accomplish. We must do it in the safest possible way, but let's not just say that because we accept a higher threshold for our operational service, that's an automatic "no," because it is inherent in the risks of being in the military.

Dr. Douglas Rokke

I agree, but that's why it's overriding in how we design and educate and how we do everything.

Dr. Melissa McDiarmid, Chair

Okay, it's really time for us to stop and listen. So folks that want to comment on any of the levels, please get in line and use the microphone, if you will.

Dr. Beatriz Orduna-Salisbury

I have a comment on the PPE and what about quality control of contracted products? There was talk that the fatigue uniforms were pre-sprayed with DEET, but then the military said that they didn't get to use it after all. In other words, quality control. Just as we were concerned about the masks and the respirators whether it is par for standard. On the medical surveillance, just the general medical surveillance, a tool that is standardized, perhaps even global, maybe this can be discussed in the UN or something, and they can keep it secret later on, but there is a standardized tool, for the medical general surveillance that is comprehensive, it is a continuing thing, it is transfer friendly, its merge friendly, if you have to separate some classified information, but later on when the individual is a veteran and sick, and information is needed, and also rapidly accessible, and what about using the state of the art? Using this dream about computers, this is long range thing, for example, maybe this can be microfilm or a chip for each soldier. Let's try to use some of the labs and if we can send people to the moon and the Viking to Saturn and all that, maybe we could have that kind of thing in ten or twenty years. That's in the medical surveillance.

In education, thoughts about education and risk communication, what about research on a simple, rapid, effective way of communication, up and down, down and up, and lateral, whatever the content is, whether for risk communication, health education, per se on biochemical warfare agents, or personal hygiene, or general decontamination, but research on that simple, rapid, effective way of communicating this. Whether it is combat or wartime when we are deploying or whether this is just for general education during peacetime, and also research on when is it good timing, when to give it, the consumer, who should be getting it. You have discussed the consumer as a target for risk communication and general education and also in itself, the types of communication, the health education, the risk management, and then the content . . .

Dr. Melissa McDiarmid, Chair

Ms. Salisbury, I'm going to have to cut you off here. If there's something really important that you want to give to me in writing, that's fine.

Dr. Irving Cohen

Thanks for a chance to submit these. By way of background, I'm a retired VA physician. I'm also board certified in public health and preventive medicine, and I'm a military veteran, but not of this conflict. I would like to discuss five specific research proposals. I will discuss them quickly and please don't respond to them until I've gone through the list, because some answer questions of the others and possible objections, I think, may be raised. First, research be initiated into the

development of specific, I'll call them, military material safety data sheets. Material data safety sheets are provided in the civilian world on virtually everything that people are going to come into contact with.

Now, in many cases, we don't know what the exposure level is, but where there is no knowledge, it says so. On the more important things that OSHA and NIOSH have developed though, we have threshold limit values. They're well established, they're well accepted. Now, you can say that they may be erring on the side of caution, but why is our military any less worthy than our civilian workers? However, the reason I said develop specific ones for the military is that if you went strictly with the civilian ones, there would be situations that people have pointed out where necessity of the mission would override concerns. The question there is one of information. People that join the military are willing to take risks, but the perception on truth or the perception that information is being withheld is I think, what causes distrust. If we could say look, and some threshold limit values are couched this way, for brief periods you may exceed, but not over this and this length of time. If this were more mission specific to the military. Again, in terms of protection gear, which has been addressed, that also can be looked at, because the OSHA requirements may list a particular grade of respirator, and may not take into account a military gas mask or a MOPP suit which might be available. So by having for at least the most important items, military specific safety data sheets, we can address many of these problems.

This also would go to the issue of information regarding drugs, since in many states now, it's the law to give a patient a drug information data sheet, a pharmacist must offer this, so those are widely available. Again, a military specific version that would prevent some of the issues and by way of comment, let me say that, I've seen the concern when these things first came out, and it's completely unfounded. The concern in giving someone this much information will get the unions out there complaining to OSHA about every little last thing. I had administrative responsibility for a five-story building that contained multiple labs, we had three different bargaining units, three different unions, the main thing was, give them the truth.

Dr. Melissa McDiarmid, Chair

Dr. Cohen, can we stop you there, because we were allotted twenty minutes to get everybody. But I would like, I think, the first comment you made is a keeper, but could you give us the rest in writing?

Ms. Alice Osherman

My first issue was in terms of substitutions, that you should consider possibly as a research project to consider the synergistic effect of the new things that you propose to use that you hope will be safer, and that you not ask the manufacturers to give you their research on it, because they may have biased responses to that. The second one, in terms of low-level exposures, people such

as myself, we know that we react to a level lower than the generally accepted safe amount, and so maybe you need to look at other people besides us that already know we are chemically sensitive, are reacting to something at a lower exposure level. And then, somebody in the group suggested that I ask or mention that there are many military sites that are on Superfund locations which already, by virtue of what they are, have many toxic items there, so maybe many of these people are being pre-exposed and are more likely to have problems down the line. Thank you.

Keith Boylan, BA
Swords to Plowshares
San Francisco, California

I'm a Persian Gulf veteran. I was part of the 2nd Armored Calvary Regiment and as you know, depleted uranium was in the arsenal. I would like to start by putting this in a framework to remember when you're going about recommendations, to remember that, my chief used to tell me that, everyday, we pray for peace and we plan for war. I believe when you go over these things and you talk about baseline limits and you talk about equipment, you need to remember wartime situations, and imagine what the situation the troops were in. I'd like to comment on what Mr. Tuite said early on when you were talking about health education and where that should fall in as far as risk assessment of medical or troops. I think it's important that initially he mentioned and he wound up by saying, a certain level of responsibility by making health education -- that the people involved have to be responsible for their decisions and I mean, maybe you can put this into recommendation terms, in research terms for me, but, I feel as a troop, when you enter basic training, you start your health education process with CTT training and so on, and you are required to be updated on the information and you continue to train as far as, with the inclusion of DU in the Common Task Training manual. We are responsible for that information. I think when you leave it in a commander's hands, you're making a risk assessment. At that point, the responsibility for the decisions disappears, whereas, like, for instance, when we were in the Gulf, there was a situation where my battery commander decided to stay in an area overnight. This area was latent with expelled rounds of A-10's and so forth, with the casings everywhere.

Now, if that was a health education decision, he would have been held responsible for his decision to put us in that situation overnight, whereas, if it's risk assessment, I feel it lets him off the hook because it could be seen as some sort of error in the information available to him. Going back to the information available to him, I think the equipment is essential when you talk about the equipment in the . . . I'm sorry, make sure the equipment can pick up the baseline levels, again set in a combat situation and that the battery commanders are educated in the level of this. In the Congressional hearings, Schwarzkopf was quoted as saying . . .

Dr. Melissa McDiarmid, Chair

I need to stop you there. If you want to give us things in writing, that's fine. I think, and the

panel is in agreement, that a lot of the things that you said have already been said this afternoon, so I think your feelings are going to be represented.

COL David Danley

Let me go back to an earlier comment made by Dr. Gerrity, that PRD5 was put together as a research plan. In fact, I gave you a research plan and there are a lot of other research plans out there, so I'm sitting here listening to what you're saying, thinking what are these people doing, are they reinventing the wheel or coming up with something new? And, if they're coming up with something new, can they focus it on anything that's different? Let me propose to you that this is prevention of Gulf War illnesses and I heard over the last two days that Gulf War illness is an individual problem, and we do not have a good research plan for dealing with the individual. I like to listen to research ideas, so I could sit there and shoot them down, but understand that all of us have dreams of what we would like to have. Let me tell you what I'd like to have for the individual.

First of all, I think we should take risk assessment out of the individual. Our war fighters should be focusing on fighting wars, not worrying about environmental contaminants and infectious diseases, and what not. I think we should develop our research product so that they don't have to worry about those risks. We have to have individual monitoring, there's no question about it. It's got to be real time, it's got to be complex, but we're talking about research, we're talking about the future. We also have to have concepts of individual susceptibility. We heard that. Genetically, people are different and we may have to come up with ways of screening people and not putting them in harms way by putting them in certain situations. But that raises ethical issues. Now why is monitoring the individual so important? It's important because the Navy wants to have an aircraft carrier manned by three hundred people. The Army wants to have a warrior, so one individual covers a 1/4 mile of battlefront and if I don't know that that individual can perform those duties, I'm going to lose the war. Our research has got to be focused to the future, and so I would ask, when you consider what your plan ought to be, it ought to be focused on the individual and how we're going to protect the individual. Thank you.

Ms. Trish Boggess

When we got ready to come back to the States, we were told, if you feel okay, if you're healthy, you're on the next plane. If you have medical concerns, go over here and we'll put you up in billets and you'll be here for awhile. And in the interest of wanting to come home, everyone said that they were healthy. And it wasn't a questionnaire, it was one of those, well you look fine, you're okay, home you go.

Ms. Gina Whitcomb

I have a copy of one of those that I'm going to present in a packet tomorrow, and it shows that many of the concerns were known and not been dealt with. The other things was a good point that Mr. Edmonds' had, and it involves notifying the spouse and letting them make their conscious decision on whether they are going to have children and what their risks are, and again, Trish is going to give her experience.

Ms. Trish Boggess

We feel that the veterans and their spouses and immediate family members need to know if there are any complications that could come from any of the inoculations, if birth defects can happen, even if there's a slight chance. I had a child four years after the Gulf, and even though it was a small birth defect, it was still a birth defect, but I had no idea that any of this could come and we were not given any notifications on any of the medications that we were given. We were just told, 'Stand here, take the shot', we were told about the anthrax, but we weren't told about any of the other shots, any of the side effects.

Ms. Gina Whitcomb

Just a last point, real quick about being part of the education process and part of training, like Jim mentioned, that the soldiers need to learn more of this in training instead of at the point they're going to deploy and need to know this. Thank you.

COL Eric Daxon

On the personal protective equipment, the services do have a program looking for better MOPP suits, better respirators. Perhaps one of the things this group could do is provide assistance in setting standards, or looking at how these things are balanced, might be one way to help out. I'd like to get back to something that was said earlier. We talk about the peacetime standards and the peacetime practices. These things are based on a combination of what the risk is, combined with the risk of putting the PPE on. In a safe work environment, that's one risk; in combat, that's another risk. It's a completely separate risk. What I really ask you to focus on, is coming up with a way of developing workplace appropriate PPE, where our workplace is now deployments. And given that the commander really is the risk manager, he really does need the tools to understand this new risk, this long term risk, so he can balance that risk appropriately with the other risks he has to face.

Mr. Joseph Miller

I'd like to basically reiterate what Dr. Heller and Colonel Thompson said about the planning process and the risk management. As a committee, we need to recommend to them and make sure that the people at DoD understand that they need to do environmental assessments in

conjunction with their pre-planning for deployments. They need to look at this ahead of time and possibly position things accordingly. The other thing is, we need to reiterate to those people that we understand that they're doing environmental hazard studies into the indigenous areas of operation where they think they may have to go, ahead of time. One of the problems that we had when we went to the Gulf was, when Colonel Schwarzkopf took over three, four, five months before all this stuff happened, he started all of this in motion, but before that time, it hadn't been done, and he didn't have time to have all this stuff in place before the actual deployment came to be. This needs to be pointed out to them and it needs to be done ahead of time, because you save a lot of hassle, a lot of aggravation and a lot of stuff that there's no way to control, by not waiting until the last minute. Our planners in the Pentagon fight wars every day. They look at the scenarios and all this stuff every day. We need to make it clear that the civilian population understands that they take the environmental concerns into consideration as they're making these plans and allow for them in the plans. Thank you.

Dr. Melissa McDiarmid, Chair

Thank you very much. I want to thank the work group. I think we did a lot of work today that's going to be helpful. I thank the folks that hung in there and gave us their comments. If folks have things written down that I didn't allow you to say, please give them to Donna and we will go over them. Hopefully when we come together in the morning, Donna, Tim and I will have digested this yet again, and it will be in a form that we can refine. We're supposed to do some priority setting tomorrow, identify what's achievable short-term and longer term, and make our recommendations in some type of a prioritized order. So, I'm thinking it's going to be easier than this session was. I think this was the major work part, and I thank everybody.

The session was adjourned

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Day 3 – Tuesday, March 2, 1999

Dr. Melissa McDiarmid, Chair

Good morning, everyone. I'm sorry it has taken us so long, but look at it this way. We did a lot of work so that you wouldn't have to and we were just trying to get things organized. I just want to say, before we go on, that the work of this group would not have happened without the able assistance of Drs. Donna Dean and Tim Tinker who worked before and after we all came and went from this room, and I just want to thank them publicly.

What we did after we broke up yesterday was try to put some order and organization into the work in progress that we did together yesterday, both with the folks that were sitting at this table and I hope that the people in the audience will be pleased to see that a number of recommendations that came from them made it to what we want to bring forward in the plenary session. We prepared a series of overheads that we hope will represent what we did, and show not only what the outcome of our deliberations was, but a little bit of the process as well. I think what we didn't finish doing yesterday that we can do now, if we look at everything together, is apply these last two refinements of what we were tasked to do. One of these refinements was to identify short-term versus long-term recommendations, and I would say the short-term are things that would be easier to be done, or are partly done, or something that we might see fielded or some successes sooner, rather than later.

Also, to prioritize, separate from that refinement, things that we clearly want to see get on the agenda , priority setting what we really want to do. It's going to be very hard to truly order everything from lowest to highest, so what I'm going to recommend to the group, and see if it's alright with you, is for us to go through and identify things that we think are absolutely priority issues and identify all of those with a different kind of indicator like an asterisk, rather than us getting into, is this seventh or eighth or tenth. Is that all right with you? [Consensus from the Group].

So, what I thought I'd do, these folks prepared overheads and I'm just going to go through and show them to you all. This is for the final tweaking before we fix them and use that for the submission in the plenary session for our group. There are some things I know that clearly need some adjustments or work, so please don't hesitate to jump in there and critique or say, "I didn't say that" if we got something you said wrong, and we've used that for the example.

A very helpful thing that Tim suggested yesterday, and this shows the multi-disciplinary nature of public health, and Tim is in risk communication, he said that before we get to the meat of specific recommendations for us to identify three overarching, big messages that we wanted to communicate in our half hour in the plenary session. So I think that was helpful. The first thing

was, he helped us pick three key messages from the prevention workgroup.

Dr. Timothy Tinker

The first message, and it really struck me, was, a lot has already been done since 1991 and it has already been brought out, and the point was made very clearly that an assessment needs to be done across the eight major elements that we've been talking about over the last day and a half. And the first thing is to evaluate the effectiveness of what has already been done since 1991. What are some of the important lessons learned and try to identify what some of those best practices are.

Dr. Melissa McDiarmid, Chair

Tim, before we go off on that, can you put that back up? I don't know whether . . . are these examples sufficient, or should we say something about specifically building in evaluation components and then evaluation research, legitimate research and that does go to . . . it does fit into our task? Mike?

CAPT Michael Kilpatrick

I think evaluation research is so important, because those first two, what worked and what didn't work, is perceived by whom? And I think that's where really the evaluation research will do that.

Dr. Melissa McDiarmid, Chair

So we like the words "evaluation research" to be on there? Let me ask. Should we put some examples there? Or, one of the thoughts that I have is specific programs that I know about. One is that, because of the DU issue, there's some specific, I don't know if you call it HAZCOM language or whatever, Eric, help me out, in the little booklet that you give to new soldiers? CTT? I know that's been put in, but are we building something to look at that effectiveness or how that's . . . I'm asking you.

COL Eric Daxon

That is really one of the three things that I really want to see. Some way to evaluate the effectiveness of the training. Not only the training, but the risk communication. It's not only how it's trained, but what's trained . . .

Dr. Melissa McDiarmid, Chair

So this goes to both content and process? We've talked about those already as outcomes that can

be looked at? So should we put an example up here, or is that too detailed?

CAPT. Michael Kilpatrick

I think without an example, the audience isn't really going to understand the scope of this.

Dr. Melissa McDiarmid, Chair

HAZCOM? That's something that the rest of the public health community recognizes, and I think the more we use those words and language and expertise in this example, I think the better we are going to be, because we can build on the discipline of public health and occupational health. We don't have to start from scratch. Colonel Thompson, can you say something about, isn't there a Joint Chiefs effort in this area as well, and can you say something about whether there is an evaluation component in that?

LT COL Bob Thompson

There is a new guidance, new doctrine that went out in December 1998, that establishes baseline requirements for deployment. Not just the major deployments, not just the future Gulf War, but we are very engaged globally, right now, because of our national security strategy. Any given day, there's upwards of 100,000 service members deployed, so we're looking at all deployments for this guidance and doctrine, and there are evaluation requirements. They had to do pre-deployment assessments, questionnaires, post-deployment questionnaires, things that are expected of them while they are deployed. These are not necessarily new, but we're trying to put a uniform structure to it, so the data that is collected, is sent back to a central repository. That question has come up a number of times the last two and a half days.

So, the central repository, in the case of the military right now, is at CHPPM in an organization called Defense Medical Surveillance System Office, where they are now collecting both peacetime and deployment data. We talked about that life cycle management, that longitudinal ability to take a look at a service member. So the evaluation or the repository data is all now at CHPPM and this database is forming. If you went there now and took an in-depth look there, it's not all there. It's not perfect, but when we look at what we've done since 1991, the improvements we've made, it's a tremendous step forward as you look at the structure that's been put together under this Defense Medical Surveillance System. So that could be used as an example, to take a look at that, where they are now from 1991 and improvements that might need to be made as we continue to improve down the road.

Dr. Melissa McDiarmid, Chair

Is it built in that there's going to be an evaluation component, are you looking at that, or is this

just a work in progress?

LT COL Bob Thompson

There is a requirement to do so. More guidance is coming out in their servicemen instruction. It's not out there yet, it's in draft form now. It's a work in progress, that part of it. From our directive that's been put out, there is a requirement to do periodic assessments of data. One of the problems in collecting data is, if you just collect it and let it sit there, and don't ever attempt to analyze it in terms of what type of prevention may be needed, both short-term and long-term. So the requirement is there now to do assessment. We've had one that's been done on the Bosnia operation for the first two years that we were involved there. It's still an interim report, but once again, they used the data coming out of this Defense Medical System Surveillance database and CHPPM has done an excellent job, taken a much broader look at that data than certainly was able to be done. Actually, Jack referred to some of that yesterday, but they're also doing the same thing in Bosnia.

Dr. Jack Heller

If the committee is interested, I have copies here of the Department of Defense directive and instruction that talks about joint medical surveillance for deployments. It goes through everything that needs to be done, responsibilities of combatant commanders, and the service Secretaries. If anybody has an interest.

Dr. Melissa McDiarmid, Chair

Why don't we put that in as another example of a new program or an enlarged program that we want to make sure has an evaluation component built into it. That will help in case there's a question about resources or necessity or what not. Can you give Donna a shorthand title for it?

LT COL Bob Thompson

The repository is called the Defense Medical Surveillance System. DMSS.

Dr. Timothy Tinker

Our second key message is to benchmark against other exemplary national or international models of prevention strategies and outcomes and I think we really benefit from hearing from our colleagues over in the UK as well as Canada about their experiences and their willingness to share those experiences.

Dr. Douglas Rokke

I'm not sure what the term "benchmark" means. Can we select another word?

Dr. Melissa McDiarmid, Chair

Sure. One of the things Tim's trying to get us to do is use action words and verbs.

Dr. Douglas Rokke

Do we want to compare and contrast? Is that what we're doing?

Dr. Melissa McDiarmid, Chair

Well, maybe we should pick one word.

Dr. Timothy Gerrity

Correct me if I'm wrong, but the term "benchmark" means this is what this organization has been able to achieve. This then sets the minimum that we have to accept as a goal to achieve. "Benchmark" is a noun, not a verb, though.

Dr. Melissa McDiarmid, Chair

I think you're right, but we're using it as a verb. Doug, fair enough. Let's circle that. Let's not hold everybody up. That's something we can fix on a break.

Dr. Timothy Tinker

The third key message has to do with our strategies for actually conducting prevention research, identifying the data gaps and then the mistakes in that, the point that Dr. McDiarmid was making about assessing the effectiveness of prevention strategies from the standpoint of content as well as concepts. The example that was provided had to do with the adoption of a comprehensive safety and health management program.

Dr. Melissa McDiarmid, Chair

Can somebody help me with that since I'm the person that's going to have to sell this? I don't exactly remember how we're going to do this. What we did yesterday after everybody left was, we tried to move some very good examples onto these three big message slides, so they may not appear where we placed them on the hierarchy of control, but they still appeared, so that's sort of how this got here. Can you say a little bit Jim about how you'd like me to put this?

Mr. James Tuite

Again, there are excellent examples of these kinds of programs in the private sector, government labs and other areas where hazardous materials are used. We're talking about programs that are currently in place among the agencies regarding chemical hygiene, quality control, quality assurance programs. I hate to use the word "quality." The 21 CFR 800 series has a lot of measures that make sure that things are done properly in biologic centers and they involve the same kinds of strategies that you'd want to use in this kind of a program, to make sure that not only is it planned well, but that you have procedures to implement that plan and internal audit systems to assess the deficiencies and limitations of the procedures. I don't know if there's an easy way to say that.

Dr. Melissa McDiarmid, Chair

I think what's throwing me off is the word "adopt," because basically, we could say that comprehensive safety and health management programs do exist, they can suggest a framework that should be looked to and the existing programs in the military need to be compared to that, to identify gaps that are missing, and then, where there are other programs, it suggests assessing their content and process against something that would be considered an exemplary standard example in the occupational health community on how to do that. Is that better? Tim, why don't you circle the word "adopt" and we'll fix that, because that's really not true.

CAPT Michael Kilpatrick

I would say,"implement best practice standards" or something along that line.

Dr. Melissa McDiarmid, Chair

Or, use them as the marker for what you want to develop.

Dr. Timothy Gerrity

I just want to be sure that in crafting general language, that we do two things. There is actually distinction between evaluation and research, and that needs a new name. Because right now, we're talking about processes, about getting the information out, how effectively do we transmit that information, but we must keep in mind that there are other disease prevention measures that are more biomedically based, vaccinations, chemoprophylaxis, etc, where there you actually have to do intervention research, trials, etc., that are really more research than evaluation.

Mr. James Tuite

But I think we are really talking about doing research into the appropriate processes, because I do not think you can just take the chemical hygiene concept from a laboratory and put it on the back burner.

Dr. Timothy Gerrity

No, I understand, but there are components of it, and the reason why I want to be careful to make the distinction, is because there is meaning in the word evaluation in certain circles, and research. For example, if you are evaluating a program, that is not research, so because it involves human subjects, it is not human research, it does not have to be reviewed by an institutional review board, etc., it's very important.

Dr. Melissa McDiarmid, Chair

I think Tim is making a good point, however, I think there's also such an animal as evaluation research and on the other hand, we're splitting some hairs here. I that's helpful for us to hear, we might have to actually write something up, but also, to make sure we address the point that Tim made, there is some work to be done here besides just doing evaluations of new programs or new training, stuff that we might consider more bench science, or the clinical trials example is a good one. I don't know whether I need to say that on this slide or not. Donna, put something next to content, and just write vaccines there so that it will be a prompt for me to remember that I need to think about that.

Dr. Douglas Rokke

What I recommend is that in addition to content and process that we put product or outcome.

Dr. Melissa McDiarmid, Chair

No, because outcome isn't the only issue of process. I think content . . .

Dr. Douglas Rokke

Well, if you explain it that way, it's fine.

Dr. Timothy Tinker

Those are our three key messages, and in support of those three messages, we have opened our panel on the first day with the framework that was presented by Dr. McDiarmid. So what Dr. McDiarmid will be doing in her presentation is constantly bridging back, using this framework, but bridging back to those three key messages, in support of those messages.

Dr. Melissa McDiarmid, Chair

I'm just going to embed the whole presentation in this because this is pretty much the bread and butter of people in occupational health. What I hope that does, is lend some credibility in the way we end up prioritizing things so we're not prioritizing things based on opinion, but based on agreed upon principles of public health and the way that we order things and do things. So, hierarchy means the order matters, as we said before. If there's a question about the rationale behind how we ordered things or how we chose the big ticket items, that this would be one of the way that we would do that. We might also want to bring up those public health priority setting issues that occurred on an earlier version of this where we talked about picking an issue where larger numbers of people are affected by the severity of exposures, taking into account the availability or feasibility of intervention measures and the chances for success. We had that on a slide. I might not put that in because of time, unless you all think that it's important to put in. Any feeling about that? Mike?

CAPT Michael Kilpatrick

I think we brought up with the PRD and other looks from other committees at this. To me, what's refreshing about this is its perspective on the issue that has a very clear focus this way, rather than a laundry list of lots of things we need to look at. This is an ordering, and I think that may be important to include because what's different about what we're doing today that groups did from after the war until now. There have been a lot of people that have worked at this and I think we need to say why this is an important effort.

Dr. Melissa McDiarmid, Chair

Okay, so we have that slide and we'll put it in. Thanks.

Dr. Timothy Tinker

So following the order of the framework, after all the brainstorming yesterday, we got together last night and went through a winnowing process and did a lot of combining and collapsing. For some of these elements we had up to 16 or 20 recommendations, and we tried to reduce that or distill that down to two or three recommendations. So, for substitution, these were the three recommendations that we boiled it down to:

- Identify less toxic chemicals;
- Restrict number of pesticides;
- Optimize vaccine potency, formulation, dose and duration.

LT COL Philip Bolton

There was a comment from the floor last night on this, which I think is very appropriate, and it is the thought that we must be looking at the interactions and the potential for synergy between these new chemicals that we're talking about.

Dr. Melissa McDiarmid, Chair

Does that go under substitution?

LT COL Philip Bolton

Well, if you're substituting it, you've got to look at the interactions of what you're substituting. Because chemical A may be less toxic, but mixed with chemical B, there may be a synergistic effect that's worse than A and B.

Dr. Melissa McDiarmid, Chair

Should we, instead of just adding a point, should we put a slash, and say consider interactions or something on the first one?

Dr. Timothy Tinker

How about, identify less toxic chemicals?

CAPT Michael Kilpatrick

Just looking at this, I still don't see the word "research" there, and I think that's very critical on the presentation.

Dr. Melissa McDiarmid, Chair

What my handlers here told me, because I said the very same thing, and they said this is all about research and we say that in the very beginning and that for all of these topics, everybody has to know that there's a prefix here, that it's research on dot, dot, dot.

CAPT Michael Kilpatrick

But I think embedded on the research part, is what COL Bolton was talking about, is that the research can't be one at a time, it has to be the synergy, and I think that's better than to try to pick just chemicals. The synergy is with the vaccines, and with the pesticides and between pesticides and vaccines, and that's why I think if you embed the research to include synergy, that we've covered the waterfront.

Dr. Melissa McDiarmid, Chair

How do you want to say that?

CAPT Michael Kilpatrick

I think you could say that up front. I think it's extremely important to say that this is research. Maybe not on this slide, because if you say it on this slide, you have to say it on all. Maybe at the beginning somewhere as you're talking about the hierarchy. That what follows is going to be proposals for research, which includes research on the synergy.

Dr. Timothy Gerrity

And when you say, identify less toxic chemicals, that could involve actually a lot of research and identification of that, and part of that identification process has to include research.

Dr. Donna Dean

We've actually got about ten sub-topics under that first point. Synergy is one of them.

Dr. Melissa McDiarmid, Chair

Okay, how about we take out the word chemical and say substances, and then put a slash and put the word synergy up there so I remember to say it, because chemicals aren't the only things we're concerned about in terms of toxic exposures. Is that okay with everybody?

Dr. Timothy Tinker

Would it also help if we had an umbrella header over substitution, such as research recommendations?

Dr. Donna Dean

What she can do in her overview is just say when she gets to the numbered slides, every time the audience sees a bullet, they should say, "research to . . ."

Dr. Melissa McDiarmid, Chair

I think that maybe that's a format that the other groups are going to use, so hopefully, it's going to be there, but I'll try to remember. You guys can hold up little signs to remind me.

Mr. James Tuite

Can we do something like this with procedures? I know that's not specifically any one of those, but that would address the issue of synergy, address a lot of the things that we're talking about.

Dr. Melissa McDiarmid, Chair

You're talking about a process as opposed to some lab bench research? You want both of those included?

Mr. James Tuite

Well, this would solve some of the concerns about the synergy, about the suitability for a certain climate, and some of the various things in the process.

Dr. Timothy Gerrity

This may not be appropriate for some things you're talking about in research, but when you talk about substitution, there's substitution of things that we use, but there's also substitution of the things they use. They being the bad guys. One of the things that we would want to strive for, through appropriate diplomatic or military means is actually to eliminate the source itself. We have chemical and biological warfare treaties etc., with the goal to eliminate the source.

Dr. Melissa McDiarmid, Chair

Jim, is it okay? I think we've got so much process stuff that I'd like to leave it the way it is, because people are going to start to think there's no discovery, scholarship lab bench work to be done in this area, and that's just not the case, so can we leave it the way it was suggested? We'll change chemicals to substance and put a slash and put synergy up there.

CAPT Michael Kilpatrick

I think what Jim is saying is part of the implementation part. That's where the process comes in.

Dr. Melissa McDiarmid, Chair

I think we have that well represented throughout.

Dr. Jack Heller

When you had that first overarching thing about looking at what DoD is doing, I assume that

applies to everything, before we go blindly recommending research we look at everything they are doing, so that would apply overarchingly.

Dr. Melissa McDiarmid, Chair

That's our first slide, yes.

Dr. Timothy Tinker

It is cross-cutting over each major element. We are assuming an assessment needs to be done of what has already been done. This particular category will boil down to these two major bullets, assessing and re-design test equipment to minimize hazards to troops, we really grabbled with this because we had to collapse probably five to seven bullets just on this one point of equipment. And then secondly, designing containers for transport of contaminated material, an example there being DU.

Dr. Melissa McDiarmid, Chair

Doug, we need some help here. That example was from you. We know what you mean, but I wasn't clear enough to defend it, so help me out here, or give me a better one.

Dr. Douglas Rokke

That's assess and redesign, what you evaluate in the current design and operation of equipment to reduce the need for hazardous materials or reduce the impact of the hazardous materials produced by the equipment.

CAPT Michael Kilpatrick

I think one word that we often use is "re-engineer."

Dr. Douglas Rokke

"Re-engineer" is a cop out.

Dr. Melissa McDiarmid, Chair

I like the word "design" because it sounds more like what we're talking about.

Dr. Douglas Rokke

What you're actually doing is you're actually evaluating the design and current operation of the equipment to minimize either the need for hazardous materials or minimize the impact of hazardous materials for a piece of equipment.

Dr. Melissa McDiarmid, Chair

Give me an example, because I didn't understand the axle one. Do you have another one?

Dr. Douglas Rokke

Yes, a good example is, if you're using a container to de-grease equipment parts, rather than have a large container of say, twenty gallons of PK, reduce it down so that you have three gallons and have a system so that you re-circulate it.

Dr. Melissa McDiarmid, Chair

Wait a minute. That's a work practice if you're talking about . . .

Dr. Douglas Rokke

No, I'm talking about the actual piece of equipment. Say if I'm going to de-grease a part of equipment and I have a large container. If I have a large container and I take that equipment and saturate it with the whole container, rather than only have two to three gallons of the solvent there, what I have is fifteen to twenty gallons. So I'm going to re-design the equipment to make the equipment more efficient, and reduce the amount of the solvent that's required.

CAPT Michael Kilpatrick

Are we saying that we're trying to assess the design to minimize the hazards? That's really where we're going. Take a look at what's there, and say, how do we minimize hazard.

Dr. Melissa McDiarmid, Chair

Yes, but it would be helpful if you guys know some sort of existing sore thumb that needs to be fixed.

Dr. Douglas Rokke

Well, that's my biggest one, in the maintenance field when they're trying to do maintenance on all this equipment.

Dr. Melissa McDiarmid, Chair

So you're talking about some dip tank or something . . .

Dr. Douglas Rokke

That's exactly what it is.

LT COL Bob Thompson

This sounds like it's getting into the previous category of substitution. And also, Jack brought up the point yesterday, and this gets to his point just a couple of minutes ago, there is a very detailed elaborate program in place called "Man Print Health Hazard Assessments", and maybe what needs to be put up there, is a look at that program to see if, indeed, it meets today's expectations and requirements, to ensure that equipment we're putting out there is user friendly.

Dr. Jack Heller

It looks at everything from blast over pressure, what happens when we fire a round from a tank, all those things that troops are exposed to when a weapon system is used. That's what I'm concerned about, looking at what we're doing and how we're doing it instead of starting from ground zero.

Dr. Melissa McDiarmid, Chair

Okay, I don't want to spend any more time on this, so I might pull one of you at the break to tweak this one.

Dr. Timothy Gerrity

I'm sorry. I've got to stick my two cents in on this one, and that is, if you want to give examples, I would suggest giving examples of things that are high hazard threats. This is what we have to focus on. If you start talking about axle grease, and you're not addressing biological and chemical warfare protection, you're missing the point.

Dr. Timothy Tinker

Health education - a good amount of time was spent talking about various populations for outreach, identifying and segmenting key audiences, and then identifying some of the barriers to their understanding of the importance of the health education message on readiness, as well as preparing them.

Dr. Douglas Rokke

The other major part is trying to determine instructional strategies, because that's going to be the total key to success.

Dr. Melissa McDiarmid, Chair

I don't have a problem with that. One of the comments made yesterday, was to try to use language that the military understands, so we thought to couch it in terms of a readiness issue, which it really is, but sometimes people seem to feel that goes to the self-inflicted versus the other-inflicted strategic disadvantage.

Dr. Timothy Tinker

Risk communication - the importance of developing and testing message content and channels. Examples there would be the whole issue of reproductive health, identifying the multiple audiences and the players, and the various information sources, assessing the communication of scientific uncertainty and other technical and complex information, assessing comprehension, utility and the value of the risk information that's being delivered, and then, identifying methods to communicate comparative risk issues, getting out the issue of real versus perceived risks.

Dr. Douglas Rokke

I don't understand "test message content and channels."

Dr. Timothy Tinker

Channels are the vehicles to formats of how people are actually obtaining the information. Are they receiving the information through print media, broadcast media. The formats would be, are they getting it from the fact sheets, Internet, through electronic media? We can certainly simplify the language.

Dr. Melissa McDiarmid, Chair

I think that's good language, because what we want people to know we're not making this stuff up. People get doctorates in this. People have been thinking about this and part of the issue is not that the information doesn't exist, put that it hasn't been applied in these settings. I will enlarge what the word channel means, but I think we need to keep hammering on this is not new stuff. This has been around for a long time, it has just failed to be applied to certain applications in these settings and we're just insisting on bringing that out to the front.

Dr. Timothy Tinker

For clarification on message content, what are the key concepts, the key principles that you're trying to convey in a message. What is it that you want the individual to do in terms of behavior as well as intent?

Environmental surveillance - developing enhanced instrumentation for environmental exposure assessment, establishing exposure limits that take into account the operating environments that folks live in, and then characterizing the environment of deployment.

Dr. Melissa McDiarmid, Chair

Remember yesterday, one of our issues was tweaking exposure limits, really, in both directions. On the one hand, in a wartime situation, things might not be as protective as we'd like them to be, but also, take into account that we might have to lower an exposure limit when they're actually living where they're working. We're not talking about eight hours a day, forty hours a week but 24 hours a day, 160 hours a week. So, there would be confidence intervals on or maximums up and maximums down.

Dr. Douglas Rokke

I think we need to clarify too, when your talking about CBR, but it's not all CBR now, it's toxic industrial chemicals and all these other things rather than just the work areas.

Dr. Melissa McDiarmid, Chair

Okay, so should we take that out and say chemical, biological and radiological toxics?

Dr. Douglas Rokke

Yes.

Dr. Melissa McDiarmid, Chair

Okay, thank you. I like that. Put a slash after CBR. Hire that man.

COL Eric Daxon

If you want to use a term that's currently being used in the military, it's NBCE, 'E' for environment. [Group consensus was to spell out the acronym for clarification].

Dr. Timothy Tinker

Anything else on environmental surveillance?

Dr. Timothy Gerrity

There needs to be a statement in there about distinguishing non combat versus combat effects.

Dr. Timothy Tinker

I think we can address that by putting it in parentheses, i.e., (combat vs non combat).

CAPT Michael Kilpatrick

The one thing that was brought up at the end of the day was understanding the limitation of the instrumentation. I don't know where to work that in, but I think we need to know what makes false positives and false negatives and any sensitivity and specificity.

Dr. Melissa McDiarmid, Chair

How about if we put that in the written version, because I'm going to get the hook before we even get to this. Donna, can you do that?

Dr. Donna Dean

It's already there.

Dr. Jack Heller

Another thing is how we prioritize high hazards and low hazards, what things we need to worry about. Obviously chemical and biological first and then industrial chemicals.

Dr. Melissa McDiarmid, Chair

For the order in which you tackle the first bullet, is that what you're saying?

Dr. Jack Heller

Right. But as the PRD said, everything has to be structured by what's the highest hazard, what's the highest threat? In certain theaters, there may be toxic industrial chemicals, there's tons of that stuff stored around the place.

Dr. Melissa McDiarmid, Chair

Again, I think that's a level of refinement that I won't say over there but would need to be captured in the written document.

LT COL Bob Thompson

Let's go back quickly to operating environments. There's really three operating environments that we now have in the military. The first is major theater of war, number two is operations other than warfare, that does get our troops involved, and the third is garrison. So, I don't know if you want to put that in there, but for the purposes of the notes, there are really three operating environments.

Dr. Timothy Tinker

How about, establish exposure limits that take into account the three major operating environments.

Dr. Douglas Rokke

Just say, for the operating environments, because that will change.

Dr. Timothy Tinker

Well, he's identifying three distinct operating environments.

Dr. Melissa McDiarmid, Chair

Did you get the three, Donna? Okay, again that's detail. I wont go into those three. Okay, we need to go.

Dr. Timothy Tinker

Medical and biomonitoring surveillance.

1. Develop a data gathering tool that spans the lives of soldiers and shuttles between VA and DoD and that links both the exposure and health outcomes.

2. Validate self-reported environmental exposures, for example the Canadian example.

3. Developing an effective surveillance system, probably for multiple end points.

Dr. Melissa McDiarmid, Chair

Wait. Even though I'm saying we have to go, I want to give people a chance to look at this.

Mr. Larry Edmonds

One thing I think that has got to be brought in is the civilian. Shuttle between the VA and the DoD. What about people out in the civilian community?

Dr. Melissa McDiarmid, Chair

Say more.

Mr. Larry Edmonds

Say more? Well, data gathering is going to be in the civilian community. People are in the service for four years. The rest of their life is in the civilian community. You need to address how you're going to monitor and follow these people.

Dr. Timothy Tinker

Can we take care of that by saying that it spans the life of military personnel, rather than just soldier?

Dr. Melissa McDiarmid, Chair

Is your issue soldier, or that it ends at VA?

Mr. Larry Edmonds

That it ends at VA.

Dr. Melissa McDiarmid, Chair

Right now, what's the responsibility of . . .

Mr. Larry Edmonds

The soldier leaves after four years, or two years, or twenty years, or whatever, his health doesn't stop at that point in time.

Dr. Douglas Rokke

It's a lot bigger, because today we've got not only the active component, we've got all the reserve and National Guard, who go off on duty continuously.

Dr. Melissa McDiarmid, Chair

I'm talking about legal limits to availability of medical records and I thought we were addressing the issue that Dr. Salisbury brought up yesterday, that I thought was very good. That was, right now there's a big firewall between even DoD and VA that has to be dealt with because she can't even get medical records of people who were on active duty last year. But I think the things you're bringing up about once you become a civilian again, I don't see how we can do an infrastructure change on medical records. That would be, the individual former military person has a right to their records.

Mr. Larry Edmonds

Well, developing a mechanism when you can't connect it . . . Right now, there's surveillance systems set up in states for reproductive outcomes that aren't allowed to go into military hospitals. Breaking down that wall, to make those people cooperate would be a simple thing. But also, how can you try to follow these people in civilian hospitals?

Dr. Melissa McDiarmid, Chair

I think that's pie in the sky.

Mr. Larry Edmonds

No it's not.

Dr. Melissa McDiarmid, Chair

I think it is. For everybody and every this and that, in every state? I think we ought to pick, as I said before, the low hanging fruit. This is an existing problem that VA can't even get a record from the military from last year. I don't have a problem making recommendations about building linkages between other state-based systems, but I think if you want to do something that's more overarching, this is one thing that really clearly needs to be done. I empathize with your concern, I do surveillance myself.

Mr. Larry Edmonds

Unless you make some recommendations, things will never change.

Dr. Melissa McDiarmid, Chair

Well I think this is a really good recommendation.

LT COL Philip Bolton

Maybe to get around this, if you look at strategies to trace the ex-military, that might not go as far as you want it to go, but at least we're looking at ways of being able to survey them and track them.

Dr. Timothy Gerrity

As long as you can identify them, you can at least develop instruments to send out to them.

Dr. Donna Dean

What about a third bullet that says -- develop a data gathering tool that spans the life of military personnel, that shuttles between, that links both the exposure and the outcome, and can be exported to the civilian environment? Or something like that.

LT COL Philip Bolton

Or tracks through civilian life.

Dr. Douglas Rokke

You can't do that. It's impossible. You'll never link VA and civilian physicians anymore than you'll be able to link DoD and civilian physicians.

LT COL Philip Bolton

The first word is "develop." Therefore, we're saying let's look at ways, rather than just shut the door now.

Mr. Larry Edmonds

You can do it. We have had civilian records of military populations. It can be done.

Dr. Donna Dean

We just need to capture the civilian life.

Dr. Jack Heller

Just be aware, that's always the big criticism of all our studies. We only look at military treatment facilities, what about all the ones we missed in the civilian population? It's going to be hard.

Dr. Timothy Gerrity

It is a growing tendency that we have groups of veterans from Korea, WWII, Vietnam, today, that say I have health problems that are due to this or that exposure that had never been raised as an issue before. Nobody paid any attention to it, and we lack appropriate data to really investigate it.

LT COL Philip Bolton

In the United Kingdom, we have cohorts of people who were exposed to nuclear tests in the late '40's and early '50's who are now articulating health concerns and there is the reason why you have to be able to track these people, so you can find out who actually was exposed. We need this tracking and the non-medical military personnel data collected and it all needs to be linked. We're both sides of the Atlantic developing systems towards this. We recognize that, but again, it goes back to the word, develop.

Dr. Douglas Rokke

I think the tools exist. What we're working with, is the exchange between the VA and the DoD is by consent of the individual only, so the data, and I'm going to give an example of one she already has here, is with the DU and the data is all there, collects everything, but in there, unless the individual specifically consents, there's nothing.

Dr. Melissa McDiarmid, Chair

I understand what they're saying, we're talking about something related, but a little different. I just know that we don't even get DoD and VA record linkages right now and we're assuming this is all done appropriately with consent. This is long, long term.

Dr. Douglas Rokke

Some of the vets out there are going to be big time offended.

Dr. Timothy Tinker

Anything else?

LT COL Bob Thompson

If you could change the word soldier to service member. It's more inclusive.

Dr. Timothy Tinker

Under work practices -

1. Explore the impact on negative health outcomes of varied work organizational structures. The example provided is reserve forces vs. full time.

2. Develop an auditing system for management control and efficiency.

Dr. Melissa McDiarmid, Chair

Wait. Are people trying to figure out what that means?

Dr. Douglas Rokke

For the work practices, I think what we were talking about with the reserve forces versus full time, we were talking about the competency or the capability of the individual to perform the work.

Dr. Melissa McDiarmid, Chair

I don't think that ought to be the first thing. I think it should be up there, because I think it's a good example, and it should be work organization, not organizational. The first thing is all this other stuff that we're not letting anybody say, higher in the hierarchy saying that it's the work practice, so we ought to do something about the way we handle potentially hazardous materials in the work environment, as a generic example of what we mean by good work practices. So can we come up with a point that would be the first one on this? That says something like that?

Dr. Douglas Rokke

Evaluate work procedures to minimize environmental exposures.

Dr. Melissa McDiarmid, Chair

Jack, does this go to some existing book you've already written, that people don't know about or don't use, about how you look at a new process and include work practice recommendations on the conduct and handling of specific...?

Dr. Jack Heller

I don't know if there's a system for it, but there's a whole program that looks at how civilian DoD workers does their job and how they are monitored and what the health requirements are for monitoring in the work place and how they do things. I'm not as familiar, but in the Military, how they do things are monitored. I'm sure there are regulations and books about that, but it's not my field. I keep bringing up, but what we need to do is start from where we are now and improve upon where we are now.

Dr. Douglas Rokke

Some time ago, I was involved in a team and we wrote TC5-400, which is environmental assessment. What it looked at was all the military missions and all the tasks and there was analysis in there on what are the impacts, all of the health and environmental hazardous material health impacts.

Dr. Melissa McDiarmid, Chair

What was that called?

Dr. Douglas Rokke

It was called the TC5-400, Commanders Guide Book to Environmental Compliance, which we wrote with Corps of Engineers.

Dr. Melissa McDiarmid, Chair

Let's just hold that thought a second. Eric, did you want to say something?

COL Eric Daxon

This work practice thing is a part of the Health Hazards Assessment Program in terms of things that they'll do to try to mitigate a hazard, one of the things that might be recommended, is a work practice or engineering control. For the Patriot, one of the controls that we had was interlocking a ladder so that if somebody pulled the ladder down to get on top of this thing, where hazardous radiation levels were, it would automatically shut the thing off.

Dr. Melissa McDiarmid, Chair

That's an engineering control.

COL Eric Daxon

Well, there are also requirements for occupational surveillance, radiation inspection programs are required, adequate ventilation is required, that stuff gets folded into the health hazard assessment.

Dr. Melissa McDiarmid, Chair

Well, why don't we do something, as Jack has said, to evaluate existing health hazard and assessment protocols for work practice recommendations, or something like that?

COL Eric Daxon

What would really be helpful out in the field is if this group could come up with metrics that compare risks, because in the whole process, we're forced to make compromises.

Dr. Melissa McDiarmid, Chair

You mean, metrics for risks in work practice recommendations? That's what we're on. I guess that would give some teeth to the evaluation process of looking at work practices.

COL Eric Daxon

Trying to compare laser eye injuries to a long term health effect. How do you balance that risk?

Dr. Douglas Rokke

That's separate from the work practice.

Dr. Melissa McDiarmid, Chair

No, he said specifically, he wants metrics to compare specific work practices, is that right?

COL Eric Daxon

Yes. But sometimes the work practices are exclusive. Some protective things really cut down on your vision and make it really hard to fly at night.

Dr. Melissa McDiarmid, Chair

Alright, Tim and Donna, can you do something with that, so we don't hold everybody up?

COL Eric Daxon

It's as simple as, do you tell a pilot to wear his goggles to reduce his vision to protect him from lasers, or do you tell him to fly with more visual acuity and run the risk of laser eye injury? Some sort of a metrics to allow that comparison to be made in a manner that can be justified to the soldiers.

Dr. Douglas Rokke

The example that he gave is a good one.

Dr. Melissa McDiarmid, Chair

Okay, let's move on. So that's going to become the first bullet because that's more of a classical work practice issue. This, explore the impact on negative health outcomes needs to become the second one, change organizational to organization, and I don't know what this third one means, so let's take it off.

Mr. James Tuite

That's pretty important, because this makes sure this stuff happens.

Dr. Melissa McDiarmid, Chair

Alright, but we need more words or something, because it's so vague, I didn't remember what it was, and it's got to go to work practices, so help me out here.

Mr. James Tuite

It could be to develop investigations to ensure implementation of management control.

CAPT Michael Kilpatrick

If you built in the metrics, you now have a measurement.

Dr. Melissa McDiarmid, Chair

It's a little bit of an overlap.

CAPT Michael Kilpatrick

But then I think you could fold the metrics and this together, because just measuring is worthless unless you go to the control and accountability that he's talking about.

Dr. Melissa McDiarmid, Chair

They want you to meld that with the one Eric gave you, Donna.

Mr. James Tuite

That would be an audit measure.

Dr. Melissa McDiarmid, Chair

All right, Tim.

Dr. Timothy Tinker

Our last element is the PPE:

1. Design of chemical protective clothing, that's durable, viable and ergonomically flexible.

2. Develop and validate data standards for PPE compliance that adheres to existing regulatory standards. Example: OSHA and MSHA.

Dr. Douglas Rokke

I think we just need "design protective clothing." That chemical eliminates too many other things.

CAPT Michael Kilpatrick

Jim brought up something. That if we say, "that adhere" it may be a legal concern We probably need to tweak that. I don't know exactly how you'd do it.

Dr. Melissa McDiarmid, Chair

Well, choosing which respirator is a different issue than having a respirator that's actually been tested in Morgantown, which is my beef. Donna, you look like you need help.

Dr. Donna Dean

If "adhere" is a problematic word, then something that's parallel . . .

Dr. Melissa McDiarmid, Chair

They want to say, "guided by existing regulatory standards."

Dr. Douglas Rokke

What you're basically saying here, is that the military is going to have to comply with OSHA, mine safety, and NIOSH.

Dr. Melissa McDiarmid, Chair

Some people are saying that's unrealistic.

Dr. Douglas Rokke

I think it should, because when we look at the criteria for exposures, if you have an individual who's coming out of the military and going back to the reservists, then he runs into this thing and he says, 'wait a minute, you know, I don't have to comply with these guidelines and this is what I have to use at work all day?'

Dr. Jack Heller

Well, you probably do comply in some cases.

Dr. Melissa McDiarmid, Chair

Well, no you don't. Your entire respirator program is a good example of the fact that you don't and that's not used only in deployments, that's used everyday in Tooele and every place else, and you guys are made to use your own respirators. I'm talking about generic respirators. People that come on the base to do a HAZCOM training or whatever, are using a respirator that nobody at OSHA's ever seen before. Well, they've seen them, but they haven't been . . .

Dr. Jack Heller

In civilian work, if we need a respirator and I work for DoD, I take the appropriate OSHA required respirator depending on what I am working with.

Dr. Melissa McDiarmid, Chair

Well that's good but that is not what is happening.

Dr. Timothy Gerrity

This goes back to what has been said that there are three conditions in which a serviceman can be in. If you are garrison in CONUS then of course you comply with OSHA standards. [Others disagree] Oh you don't comply with OSHA standards, is that what you are saying?

Dr. Douglas Rokke

This is absolutely correct. It doesn't

Dr. Timothy Gerrity

In a deployment situation, and depending upon what kind of deployment situation, that is also going to vary.

Dr. Douglas Rokke

Let me give you an example. The military respiratory protection, the one that is issued to the troops, is either an M17 or an M40. Neither one of those comply with OSHA, or any other stuff, whatsoever. Those things are used both in deployment, in garrison, and out in the field. When we did all the work at the Nevada test site, we could not use any of the military equipment We had to use strictly the stuff that complied with OSHA and this, to do it.

Dr. Timothy Gerrity

Well, I don't think we're in disagreement.

Dr. Melissa McDiarmid, Chair

Well, let's go for the moon here and see what happens.

Dr. Timothy Gerrity

Well, wait a minute. If you go for the moon, you're going to create an unrealistic expectation for what occurs during deployment and I think that is more harmful than any kind of good communication.

Dr. Melissa McDiarmid, Chair

Well, we'll tweak it. I understand. I don't expect people to wear an SCBA, but I expect that when they're on US soil doing a training exercise, or doing something potentially hazardous, to use a respirator that any other worker in the country would have had, if they had tested it.

Dr. Timothy Gerrity

And you do not hear any disagreement here. The problem is, that statement does not make that distinction.

LT COL Philip Bolton

What about "strive to adhere to" because that covers . . .

Dr. Douglas Rokke

It doesn't matter if you're in CONUS, or you're OCONUS in deployment or in wartime, this has to be done. I think she's absolutely right.

LT COL Bob Thompson

I have to agree with Tim, because you have to make the distinction here, because there are very unique situations when you talk about these three distinct operating environments that the military can be. And Tim is right. We're not arguing about the peacetime, garrison situation at all. If you try to extrapolate that to wartime, that's where you're creating problems for the military in conducting their mission.

Dr. Douglas Rokke

The wartime mission, very simply has to strive to adhere to this. And because it did not, we've got a real problem. She's right.

LT COL Bob Thompson

It goes back to what Eric Daxon said about risk management. Everything we're doing when we take a look at risk management is tradeoffs and that's why Col. Daxon wants to have these metrics so the commander can do the risk management, risk tradeoff assessment.

LT COL Philip Bolton

If you insert the words, "strive to," you have no excuse for not adhering to those standards back in continental United States on peacetime operations.

Dr. Melissa McDiarmid, Chair

If we use "strive to," you can drive a truck through that right now and that's what we have right now, so, we'll fix it. I hear what everybody's saying. I promised the people sitting out there that they'd have a chance to say something, so if you have a burning, I mean, burning issue . . .

Dr. Dalia Spektor

The sense I got from listening this morning to this summary is that most of the things that apply during peacetime here in the US. I didn't hear any discussion about intelligence information about possible exposures in other parts of the world and that could be mapped in some ways, at least for regular ambient exposures. The other thing that was not taken into account were cases like pesticide contractors in Saudi Arabia, and we're not sure what they used and how much they used and those were hired by the US, and there must be similar experiences in other situations. The other thing is exposures to pesticides of people who grow their own or the family sends them packages and there is no control for it, and that can be huge. But I think that what worries me the most, is the lack of prevention against things that may happen in other countries during deployment.

Dr. Irving Cohen

I hope these are non-controversial editorial suggestions, that I'm making. The word "synergy" is a very poor choice of words. It has a very specific meaning, and I think that we would wish to use the word "interaction." It covers a much broader waterfront. Second, you were searching for the right word in describing the life cycle of the soldier, and nowhere on there is the word, 'veteran,' and that's what we call a soldier when he gets his DD-214 and becomes a civilian again. So I think the word should be changed to soldier/veteran for clarity. The third is that I would argue on the evaluation slide, that you do reconsider whether the word 'outcome' belongs there, although, hopefully, we'll never face outcome situations where we would have to test some of these hypotheses, if you stick strictly to process, you're doing exactly what Representative Sanders warned against. You have activity without any progress, and there are enough GAO reports in the field of prevention and other studies in the field of prevention regarding the waste of process without measures of outcome.

Mr. Joseph Miller

One of the things we discussed last night when we were brainstorming, was the possibility of communicability in all this stuff. That's something that we'd like to see some sort of

recommendation. I used to give blood every time I could, but I haven't done it in over eight years. It's something that I would like to see addressed. Is it safe for us to do that? It's off the subject, but it's something we need you people to find out and get us an answer on. It's one of the things I'm concerned about. The other concern I have is, I was up about 3:00 in the morning last night talking to Rebecca Bascom, we sat in the lobby talking about it, and one of the problems she was having was getting information. She was having a lot of problems because we don't have a dialog between the VA, the DoD and the doctors in our communities. The doctors in our communities, our family doctors, need to get a lot of this information that we're putting out. We need to set up some kind of system for them to get the information or a database or a call line, so that when they're treating us, they know what's going on. One of the things that I did when I was seeking treatment for my problem was I went through the Gulf War clinic at Fort Bragg, and Dr. Owens down there called was my personal physician and talked to him for over two hours to tell him what he knew, because Dr. Owens had seen over 2,000 people and my doctor, the only one he was dealing with was me.

Dr. Melissa McDiarmid, Chair

Joe, if you have anything else written that you'd like to give to Donna, please do that, because we still need to do our prioritization and what we're desperate about.

Ms. Alice R. Osherman

I just wanted to give a compliment. You have included self-reporting. Thank you.

Mr. Joseph Miller

I would also like to thank you people for being here and listening to what's being said and spending time talking to people. Because in the past that has been a problem. A lot of people have not listened to things that have been said.

Mr. Keith Boylan

I just want to say real quick, for the PPE please reconsider what Dr. Rokke said, because I think it's important when we talk about exposures in CONUS. We're here, not because of exposures in CONUS, we're here because of exposures overseas, and I think in deployment situations, there has to be some standard that people have to follow, because that's why we're here. When you get in certain combat situations, all those rules go out the door and troops are exposed to things they shouldn't be. Thank you.

Dr. Melissa McDiarmid, Chair

We're supposed to say something in the presentation about short-term, long-term, and since we don't have time to go through each thing, is it fair to say, or the thing that comes to my mind is, a shorter-term ordering of what we're recommending is to start with what exists in evaluating, to look at what already exists? Is that a fair statement? And then, can I hear some nominations or some things that people have passionate commitment about, things that you think we should put an asterisk by in our list of things we brought up?

Dr. Douglas Rokke

Real easy. PPE.

Mr. James Tuite

Record keeping and adhering to OSHA requirements.

Dr. Melissa McDiarmid, Chair

I just want to remind you, that's way at the bottom of the hierarchy. One of the things that I want to recommend is Jim, what you said, which is to have a comprehensive safety and health management program piece. That's higher on the hierarchy. These are things that are existing. They're already on our list. Short is evaluation of existing interventions since '91. That's already out there, ensuring an evaluation and outcome component. PPE is a passionately held recommendation. Anything else?

LT COL Bob Thompson

The metrics issue that Col. Daxon brought out is extremely important. It was under work practices.

CAPT Michael Kilpatrick

I think the research on minimizing elements and vaccine efficacy, efficiencies, is something we need to work on.

Melissa McDiarmid, Chair

Thank you everybody for really good work. I think this is going to be a very cohesive, and if followed, reasonable plan.

The session was adjourned.

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